HAZARDOUS WASTE SITE INVESTIGATION
Interstate Concentrating Co.,
Kearny, N.J.

TDD #02-8008-03

July 20, 1981

Participating Personnel:

Fred C. Hart Associates, Inc.

Frances B. Barker, Biochemist
Mary Manto, Public Health Specialist
Peter M. Cangialosi, Sr. Environmental Engineer

Report Prepared by:

Frances B. Barker

Frances B. Barker
Biochemist

FBB/hs

338665

Frances B. Barker
Biochemist

TDD #02-8008-03

BACKGROUND

Interstate Concentrating Co. is an active brass reprocessing plant with an inactive landfill on site. The four acre plant accepts brass mill skimmings, washes them with recyclable water, and stores the upgraded material in drums. One lagoon holds the recycled plant process water. There is a municipal storm water drainage pond adjacent to the plant lagoon. A dike separates the two ponds. The inactive landfill on site contains 322,000 pounds of mercury/ concrete rubble.

NATURE OF PROBLEM

The inactive landfill on site presents no environmental or health hazard at this time. Chemical analysis of the rubble indicates that the material is nonhazardous.

There is an potential for overflow between the municipal storm water drainage pond and the plant lagoon when inflow is high.

STATUS OF INVOLVEMENT

This site should be rated low priority. No sampling is recommended at this time.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

ed by HQ

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition *(Section II)*. File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency, Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Interstate Concentrating Company

B. STREET *(or other identifier)*: 275 Dukes Street

C. CITY: Kearny

D. STATE: N.J.

E. ZIP CODE:

F. COUNTY NAME: Hudson

G. SITE OPERATOR INFORMATION

1. NAME: Same as above
2. TELEPHONE NUMBER:
3. STREET:
4. CITY:
5. STATE:
6. ZIP CODE:

H. REALTY OWNER INFORMATION *(if different from operator of site)*

1. NAME: Same as above
2. TELEPHONE NUMBER:
3. CITY:
4. STATE:
5. ZIP CODE:

I. SITE DESCRIPTION: operational metal reclaimers

J. TYPE OF OWNERSHIP

[ ] 1. FEDERAL [ ] 2. STATE [ ] 3. COUNTY [ ] 4. MUNICIPAL [X] 5. PRIVATE

II. TENTATIVE DISPOSITION *(complete this section last)*

A. ESTIMATE DATE OF TENTATIVE DISPOSITION *(mo., day, & yr.)*:

B. APPARENT SERIOUSNESS OF PROBLEM

[ ] 1. HIGH [ ] 2. MEDIUM [ ] 3. LOW [ ] 4. NONE

C. PREPARER INFORMATION

1. NAME:
2. TELEPHONE NUMBER:
3. DATE *(mo., day, & yr.)*:

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME: Thomas Brady
2. TITLE: Princ. Envir. Tech.
3. ORGANIZATION:
4. TELEPHONE NO. *(area code & no.)*:

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
Thomas Harrington	DWR - NJDEP	

C. SITE REPRESENTATIVES INTERVIEWED *(corporate officials, workers, residents)*

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
Barry Brown	President	
Morley G Cole	Vice President	

D. GENERATOR INFORMATION (sources of waste)

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
Process Waste			

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED
N/A			

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS

G. DATE OF INSPECTION (mo., day, & yr.)	H. TIME OF INSPECTION	I. ACCESS GAINED BY: (credentials must be shown in all cases)
April 8, 1980	10:30 A.M.	[X] 1. PERMISSION [ ] 2. WARRANT

J. WEATHER (describe)

cool, clear

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN (mark 'X')	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER			
b. SURFACE WATER			
c. WASTE			
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL			
h. VEGETATION			
i. OTHER (specify)			

B. FIELD MEASUREMENTS TAKEN (e.g., radioactivity, explosivity, PH, etc.)

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS

Continue On Page 3

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

D. PHOTOS

1. TYPE OF PHOTOS

[ ] a. GROUND [ ] b. AERIAL

2. PHOTOS IN CUSTODY OF:

E. SITE MAPPED?

[X] YES. SPECIFY LOCATION OF MAPS

Attached

F. COORDINATES

1. LATITUDE (deg.-min.-sec.)

40°45' 05".

2. LONGITUDE (deg.-min.-sec.)

74°08' 05"

V. SITE INFORMATION

A. SITE STATUS

X 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)

[ ] 2. INACTIVE (Those sites which no longer receive wastes.)

[ ] 3. OTHER (specify):
(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?

[ ] 1. NO [X] 2. YES (specify generator's four-digit SIC Code):

C. AREA OF SITE (in acres)

3 - 4

D. ARE THERE BUILDINGS ON THE SITE?

[ ] 1. NO [X] 2. YES (specify):

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL	X	1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE	X	3. DRUMS		3. VOLUME REDUCTION	X	3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND	X	4. RECYCLING/RECOVERY	X	4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND	X	5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this form.

[ ] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [ ] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. LIQUID [X] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [ ] 2. IGNITABLE [ ] 3. RADIOACTIVE [ ] 4. HIGHLY VOLATILE

[X] 5. TOXIC [ ] 6. REACTIVE [X] 7. INERT [ ] 8. FLAMMABLE

[ ] 9. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Partial - See attached Eckhardt list

Continue On Reverse

2. Estimate the amount (specify unit of measure) of waste by category, mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT Unknown	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
(1) PAINT, PIGMENTS	(1) OILY WASTES	(1) HALOGENATED SOLVENTS	(1) ACIDS	(1) FLYASH	(1) LABORATORY, PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify)	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify)	(3) CAUSTICS	X (3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify):
			(6) CYANIDE	X (6) OTHER (specify): Mercury	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER (specify)		

C. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE (place in descending order of hazard)

1. SUBSTANCE	2. FORM (mark 'X') a. SOLID	b. LIQ.	c. VAPOR	3. TOXICITY (mark 'X') a. HIGH	b. MED.	c. LOW	d. NONE	4. CAS NUMBER	5. AMOUNT	6. UNIT
Mercury				X						

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

[ ] A. HUMAN HEALTH HAZARDS

Continue On Page 5

[ ] B. NON-WORKER INJURY/EXPOSURE

[ ] C. WORKER INJURY/EXPOSURE

[ ] D. CONTAMINATION OF WATER SUPPLY

[ ] E. CONTAMINATION OF FOOD CHAIN

[X] F. CONTAMINATION OF GROUND WATER

Company has several dug lagoons for containment of scrubber cooling water, process wash water, boiler blowdown, and lavatory waste. All lagoons have overflows leading to dumpsite on north side of property. Possibility of contamination from past reclaimation of mercury and other toxic wastes.

[X] G. CONTAMINATION OF SURFACE WATER

Open dump on east side of property contains standing water with high oil/grease content. This site is used as garbage dump by company for domestic trash and some process scrap. Also spillover from lagoons reaches neighboring drainage ditches.

[ ] H. DAMAGE TO FLORA/FAUNA

[ ] I. FISH KILL

[ ] J. CONTAMINATION OF AIR

[ ] K. NOTICEABLE ODORS

[X] L. CONTAMINATION OF SOIL

Area on north and east side of property used as disposal sites. North side has been used since company first opened in 1941 for disposal of process waste. Although Mr. Brown stated that all material received for recovery is returned to origin, including scrap, he later stated by - products and unwanted materials are disposed of on-site. Mercury-containing materials were processed at the site, so probability of Mercury contamination in dumps exists, along with whatever else was processed.

[ ] M. PROPERTY DAMAGE

Continue On Page 7

II. HAZARD DESCRIPTION *(continued)*

[ ] N. FIRE OR EXPLOSION

[X] O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

Several lagoons are present for holding process wash water and cooling water.

[ ] P. SEWER, STORM DRAIN PROBLEMS

[ ] Q. EROSION PROBLEMS

[ ] R. INADEQUATE SECURITY

[ ] S. INCOMPATIBLE WASTES

VIII. HAZARD DESCRIPTION (continued)

[ ] T. MIDNIGHT DUMPING

[X] U. OTHER (specify)

Company is involved in reclaiming metals from scrap and used parts, using gravity seperation and washing. According to Mr. Brown and Cole, they now deal solely with brass scrap and old gas meter boxes.

The gas meters are put through a furnace to melt the solder joints and seperate the parts. Although the two company representatives stated that only before 1970 did they deal with other materials, a report from PPG Industries state that between 1973-1975 17 tons of mercury was processed on site.

It appears that an area north and east of the plant buildings has been used since 1941 as a disposal site for process wastes.

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE (specify units)
1. IN RESIDENTIAL AREAS	HEAVILY URBANIZED AREA			
2. IN COMMERCIAL OR INDUSTRIAL AREAS	HEAVILY URBANIZED AREA			
3. IN PUBLICLY TRAVELLED AREAS	ADJACENT			
4. PUBLIC USE AREAS (parks, schools, etc.)	ALL WITHIN 1/2 MILE			

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER (specify unit)	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
D. POTENTIAL YIELD OF AQUIFER	E. DISTANCE TO DRINKING WATER SUPPLY (specify unit of measure)	F. DIRECTION TO DRINKING WATER SUPPLY

G. TYPE OF DRINKING WATER SUPPLY

[ ] 1. NON-COMMUNITY < 15 CONNECTIONS

[ ] 2. COMMUNITY (specify town): > 15 CONNECTIONS

[ ] 3. SURFACE WATER

[ ] 4. WELL

Continue On Page 9

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA (continued)

B. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COMMUNITY (mark 'X')	5. COMMUNITY (mark 'X')
Process water	230'	on site	X	

C. RECEIVING WATER

1. NAME

[ ] 2. SEWERS
[ ] 3. STREAMS/RIVERS
[ ] 4. LAKES/RESERVOIRS
[ ] 5. OTHER (specify):

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN

[ ] A. KNOWN FAULT ZONE
[ ] B. KARST ZONE
[ ] C. 100 YEAR FLOOD PLAIN
[ ] D. WETLAND
[ ] E. A REGULATED FLOODWAY
[ ] F. CRITICAL HABITAT
[ ] G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

X	A. OVERBURDEN	X	B. BEDROCK (specify below)	X	C. OTHER (specify below)
	1. SAND				
	2. CLAY				
	3. GRAVEL				

XIII. SOIL PERMEABILITY

[ ] A. UNKNOWN
[ ] B. VERY HIGH (100,000 to 1000 cm/sec.)
[ ] C. HIGH (1000 to 10 cm/sec.)
[ ] D. MODERATE (10 to .1 cm/sec.)
[ ] E. LOW (.1 to .001 cm/sec.)
[ ] F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA

[ ] 1. YES [ ] 2. NO 3. COMMENTS

H. DISCHARGE AREA

[ ] 1. YES [ ] 2. NO 3. COMMENTS

I. SLOPE

1. ESTIMATE % OF SLOPE: 0

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.

J. OTHER GEOLOGICAL DATA

Filled land

XIV. PERMIT INFORMATION

List all applicable permits held by the site and provide the related information.

A. PERMIT TYPE (e.g., RCRA, State, NPDES, etc.)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, & yr.)	E. EXPIRATION DATE (mo., day, & yr.)	F. IN COMPLIANCE (mark 'X')		
					1. YES	2. NO	3. UNKNOWN
None							

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

[X] NONE [ ] YES (summarize in this space)

NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition *(Section II)* information on the first page of this form.

SITE: NUMBER 1684 PAGE 1 FOR THIS SITE
INTERSTATE CONCENTRATING CO. HUDSON
X----
KEARNEY,NJ X----

COMPANY: COMPANY-FACILITY NUMBER 41012
PPG INDUSTRIES, INC.
INDUSTRIAL CHEMICAL DIVISION
NATRIUM PLANT
P.O. BOX 191
NEW MARTINSVILLE,WV 26155

FIRST YEAR USED: 1973
LAST YEAR USED: 1975

HUNDRED TONS: 0.17
THOUSAND CUBIC YDS.: .
THOUSAND GALLONS: .

COMPOSITION OF WASTE:

HEAVY1 HEAVY3

LEGEND: IF LISTED, THEN PRESENT IN WASTED. IF NOT LISTED, THEN ITEM NOT PRESENT, NOT KNOWN IF PRESENT, OR DATA MISSING.

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D C —1972

1 MILE

5000 6000 7000 FEET

1 KILOMETER

NEW JERSEY

ROAD CLASSIFICATION

Heavy-duty	Light-duty
Medium-duty	Unimproved dirt
U. S. Route	State Route
Interstate Route	

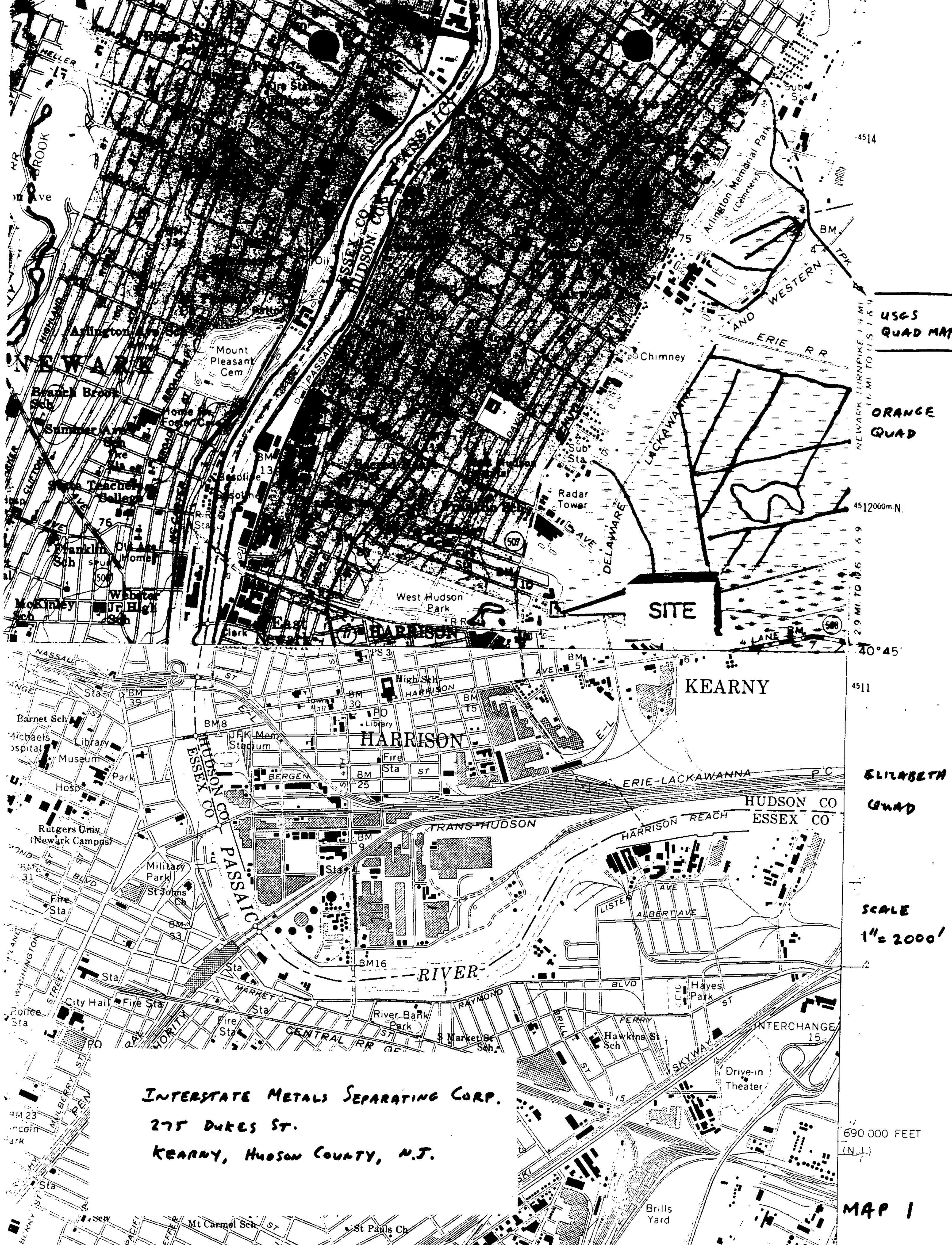
INTERSTATE METALS SEPARATING CORP.
REFERENCES

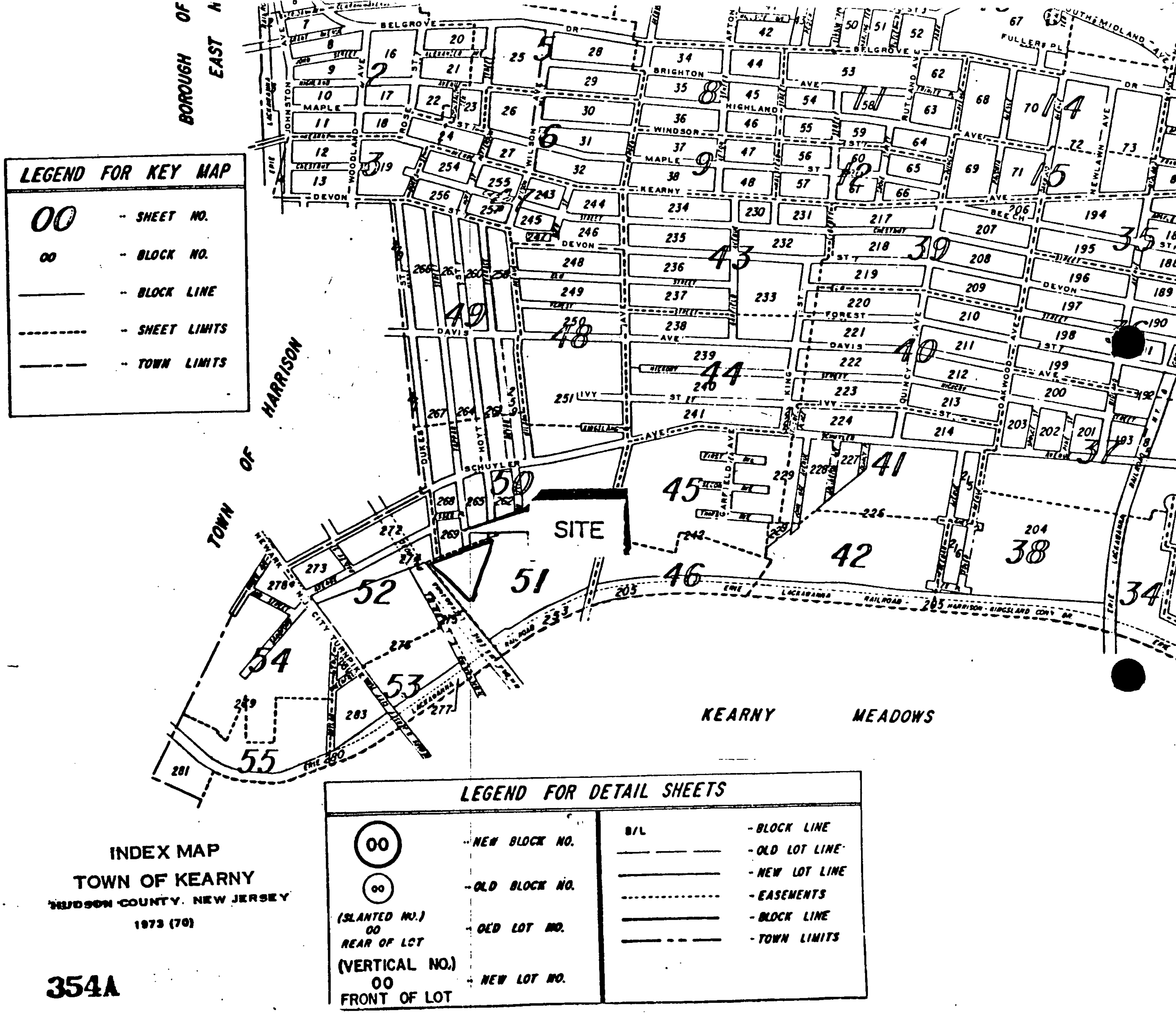
MAPS

1. USGS QUAD MAP
2. TOWN OF KEARNY TAX MAP
3. NJDEP/DWR WATER SUPPLY OVERLAY MAP #26
4. NJDEP/DWR GEOLOGIC OVERLAY MAP #26

ATTACHMENTS

A.	IMSC ENVIRONMENTAL REPORT - J.H. CROW CO.	9/87
B.	IMSC SUPPLEMENTAL ENVIRONMENTAL REPORT - J.H. CROW CO.	3/88
C.	NJDEP SAMPLING EPISODE, ETC ANALYTICAL DATA	9/87
D.	CORRESPONDENCE: NJDEP TO IMSC	4/27/88
E.	NJDEP/DHWM/BPA PRE-SAMPLING ASSESSMENT	2/2/88
F.	NJDEP/DHWM ENFORCEMENT INSPECTION	11/24/87
G.	MEMO TO FILE: INTERVIEW WITH FORMER EMPLOYEE	11/13/87
H.	CORRESPONDENCE, DHWM ENFORCEMENT TO BPA REQUEST FOR PA.	9/16/87
I.	TRENTON DISPATCH NOTIFICATION REPORT	1/22/87
J.	NJDEP UNDERGROUND STORAGE TANK QUESTIONAIRE	8/87
K.	MEMO TO FILE: NJDEP/DHWM MEETING WITH IMSC	1/10/86
L.	NJDEP/BEERA MEMO: REVIEW OF SOIL DATA	8/20/85
M.	HUDSON REGIONAL HEALTH COMMISSION SOIL SAMPLING, CORRESPONDENCE.	7/85
N.	NJDEP SITE INSPECTION	5/14/81
O.	NJDEP SITE INSPECTION, SAMPLING DATA	3/24/81
P.	NJDEP CORRESPONDENCE: WASTE ROCK CLASSIFICATION	2/11/81
Q.	EPA CORRESPONDENCE: WASTE ROCK CLASSIFICATION	1/29/81
R.	CORRESPONDENCE: NJ DEPT. OF LABOR TO EPA	12/23/80
S.	INTERNATIONAL TESTING LABORATORIES SAMPLING DATA.	8/26/80, 12/3/80
T.	NJDEP AIR PERMIT - METAL KILN SCRUBBER	10/12/72
U.	CORRESPONDENCE: ECOLOGY INTERNATIONAL TO KEARNY HEALTH DEPT.	8/78
V.	HUDSON MUNICIPAL AIR POLLUTION COMMISSION FIELD INVESTIGATION REPORT.	2/6/73, 8/22/78
W.	CORRESPONDENCE: KEARNY HEALTH DEPT./IMSC	1976-1986
X.	NJDEP WELL RECORDS INFORMATION	


USGS QUAD MAP
ORANGE QUAD
ELIZABETH QUAD
SCALE 1" = 2000'
SITE
INTERSTATE METALS SEPARATING CORP.
275 DUKES ST.
KEARNY, HUDSON COUNTY, N.J.
NEWARK
HARRISON
KEARNY
PASSAIC
RIVER
HUDSON CO
ESSEX CO
ERIE-LACKAWANNA
TRANS-HUDSON
HARRISON REACH
Arlington Memorial Park (Cemetery)
Mount Pleasant Cem
West Hudson Park
Chimney
Radar Tower
ERIE RR
AND WESTERN
DELAWARE
LACKAWANNA
High Sch
Town Hall
PO
Library
JFK Mem Stadium
Fire Sta
Rutgers Univ (Newark Campus)
Military Park
St Johns Ch
City Hall
Police Sta
River Bank Park
Hayes Park
Hawkins St Sch
INTERCHANGE 15
SKYWAY
Drive-in Theater
Brills Yard
Mt Carmel Sch
St Pauls Ch
690 000 FEET (N.J.)
40°45'
4512000m N.
MAP 1



MAP 2

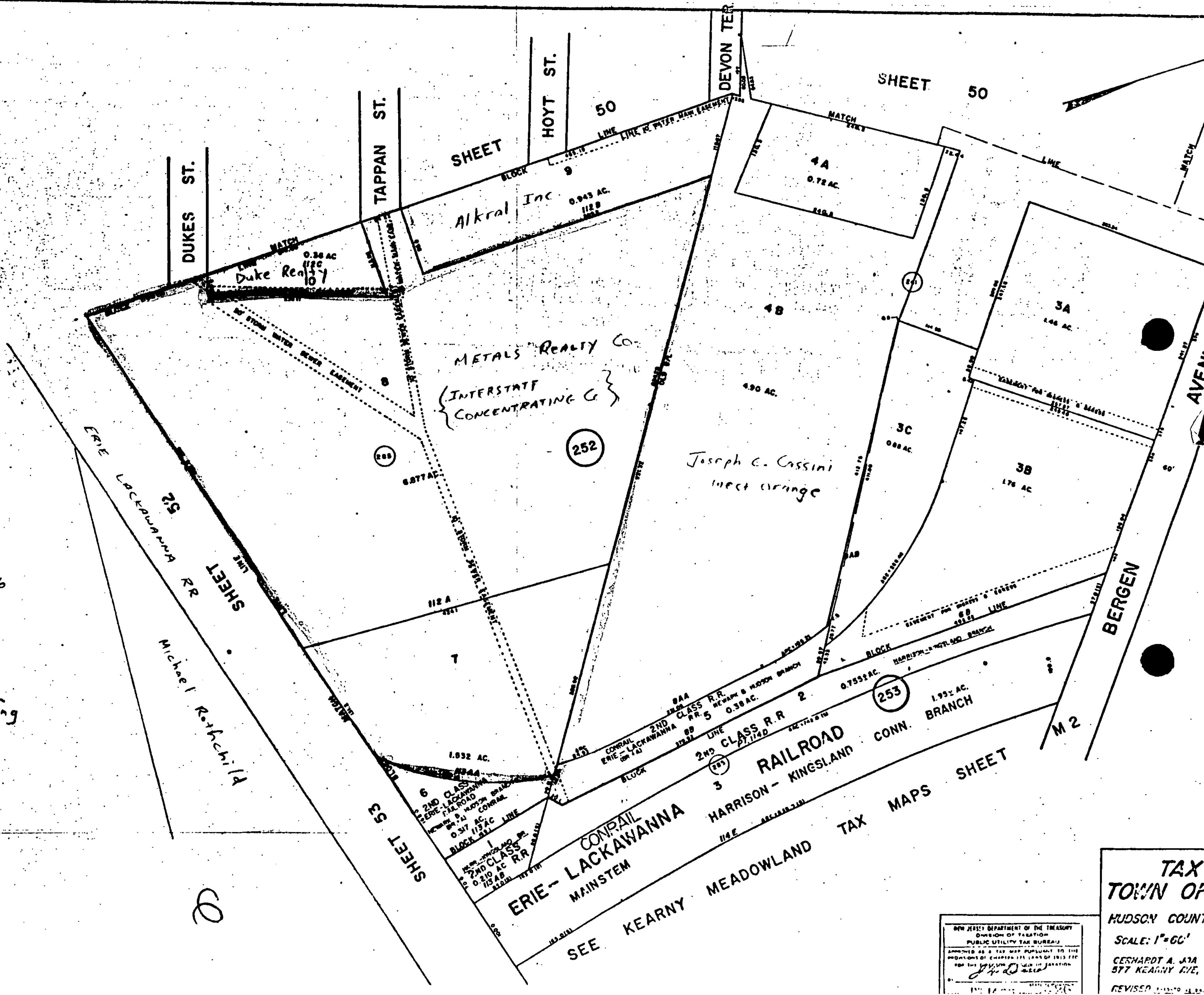
INDEX MAP
TOWN OF KEARNY
HUDSON COUNTY, NEW JERSEY
1973 (70)

354A

MAP 2

BL 276
L 3

Kearny
Smelting



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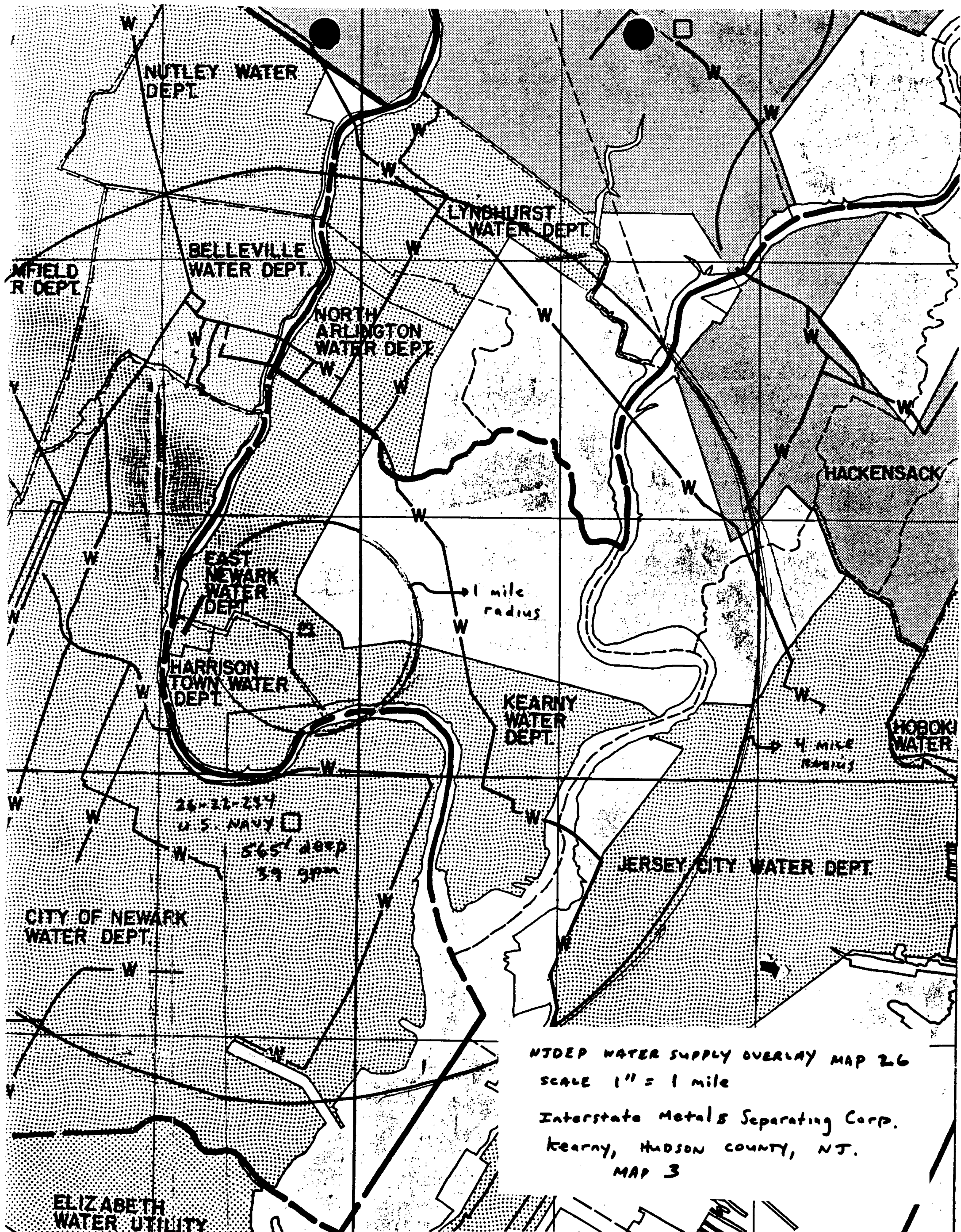
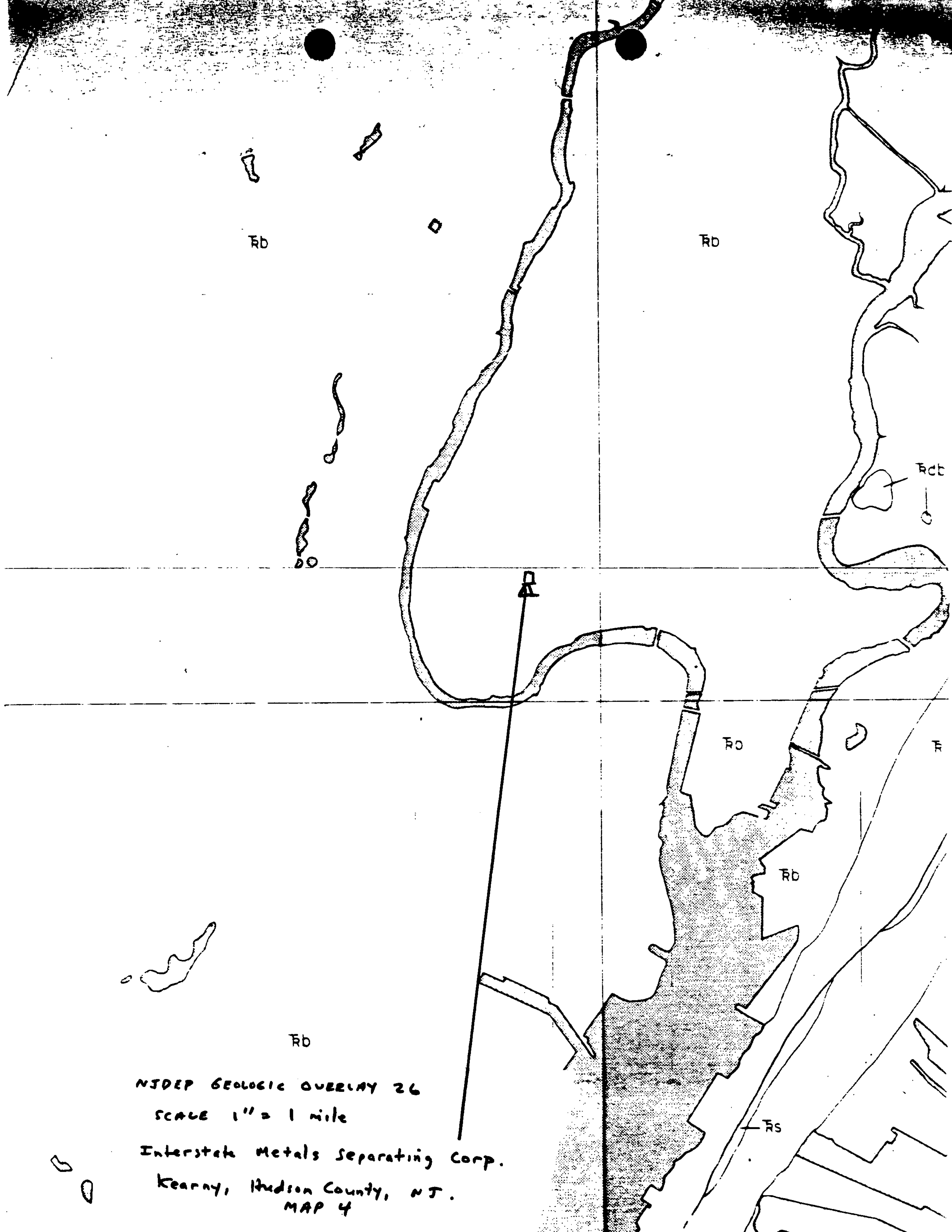

NUTLEY WATER DEPT.
LYNDHURST WATER DEPT.
BELLEVILLE WATER DEPT.
NFIELD R DEPT.
NORTH ARLINGTON WATER DEPT.
HACKENSACK
EAST NEWARK WATER DEPT.
1 mile radius
HARRISON TOWN WATER DEPT.
KEARNY WATER DEPT.
4 MILE RADIUS
HOBOK WATER
26-22-254
U.S. NAVY
565' deep
59 gpm
JERSEY CITY WATER DEPT.
CITY OF NEWARK WATER DEPT.
ELIZABETH WATER UTILITY
NJDEP WATER SUPPLY OVERLAY MAP 26
SCALE 1" = 1 mile
Interstate Metals Separating Corp.
Kearny, HUDSON COUNTY, NJ.
MAP 3

LEGEND

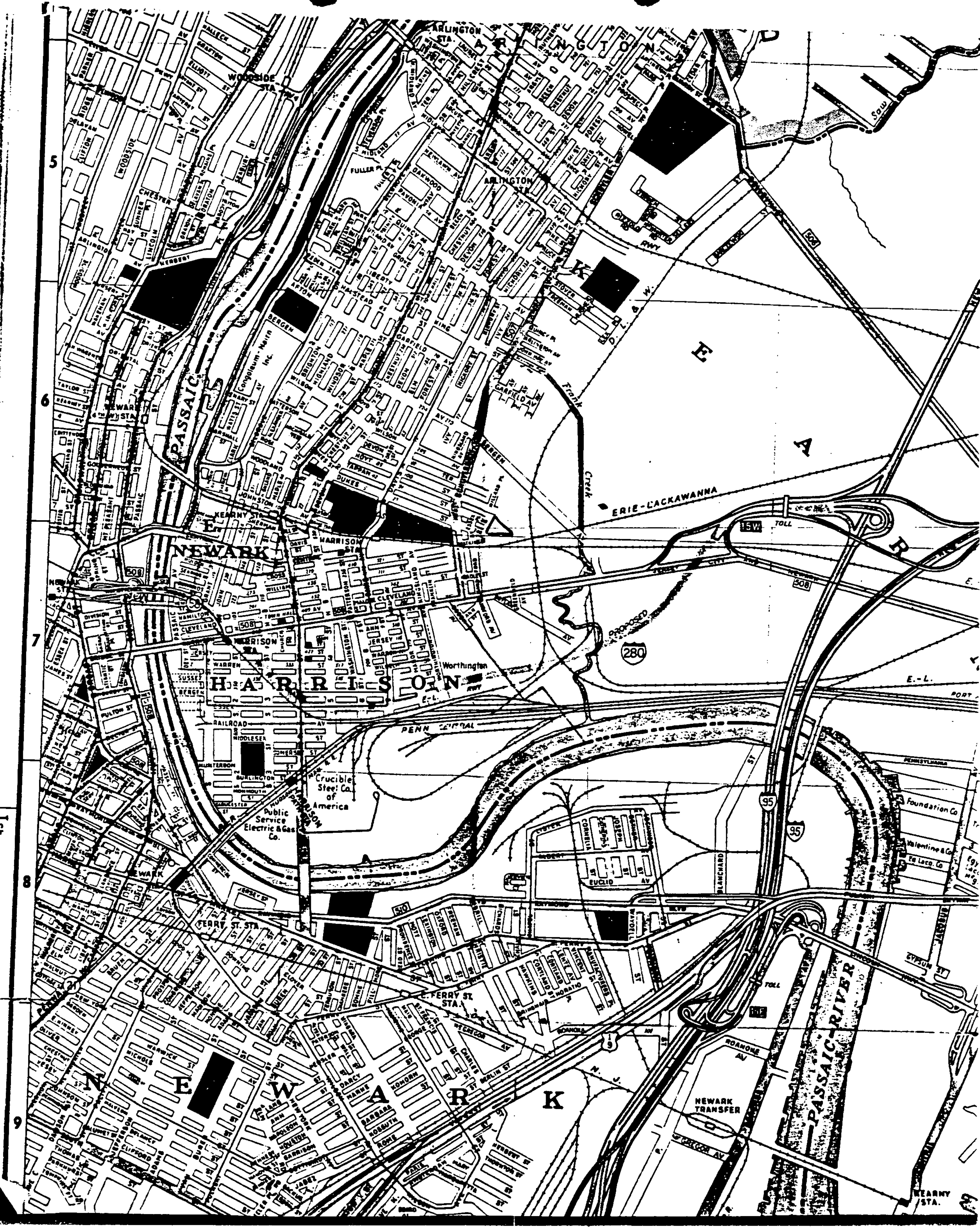
- AREA SERVED BY PRIVATE WATER SERVICE COMPANIES
- AREA SERVED BY REGIONALLY OWNED WATER SERVICE COMPANIES
- AREA SERVED BY MUNICIPALLY OWNED WATER SERVICE COMPANIES
- AREA NOT PRESENTLY SERVED BY WATER SERVICE
- PUBLIC SUPPLY WELLS
- SURFACE WATER INTAKE
- —W— MAJOR WATER MAINS
- TOWNSHIP BOUNDARIES
- COUNTY BOUNDARIES
- STATE BOUNDARIES

BUREAU OF
KEMBLE WID

COMPILATIO



NJDEP GEOLOGIC OVERLAY 26
SCALE 1" = 1 mile
Interstate Metals Separating Corp.
Kearny, Hudson County, NJ.
MAP 4



ARLINGTON
ARLINGTON STA.
WOODSIDE STA.
KEARNY
PASSAIC
Congoleum-Nairn Inc.
D. L. & W.
Frank Creek
ERIE-LACKAWANNA
NEWARK
KEARNY STA.
HARRISON STA.
NEWARK STA.
HARRISON
Worthington
PROPOSED
280
PENN CENTRAL
Crucible Steel Co. of America
Public Service Electric & Gas Co.
95
TOLL
Foundation Co
Valentine & Co
FERRY ST. STA.
E. FERRY ST. STA.
NEWARK TRANSFER
PASSAIC RIVER
KEARNY STA.
N E W A R K
5
6
7
8
9

INTERSTATE METALS SEPARATING CORP.
Environmental Report

September 2, 1987

Prepared by

John H. Crow, Ph.D.

Anne L. Kruger, Ph.D.

Timir Hore, Ph.D. (pending)

of

J. H. CROW COMPANY, INC.

365B HOFFMAN ROAD
PORT MURRAY, NEW JERSEY 07865
(201) 689-0332

INTERSTATE METALS SEPARATING CORP.
Environmental Report

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INTERSTATE METALS SEPARATING CORP.

Environmental Report

EXECUTIVE SUMMARY

Interstate Metals Separating Corporation reclaims metals by physical processes, for instance, by mechanical and heat processes. It has been operating this business at the same site in Kearny since 1943. During early years some of the residuals from the recovery processes were deposited on the site. In recent years essentially all of the separated materials have been sold and removed from the site.

J. H. Crow Company conducted a comprehensive investigation of the site to learn what, if any, environmental hazards are present. The findings of this investigation, which are discussed in detail in this report, provide the basis for the conclusions given here.

Soil containing one or more toxic metals at levels above the New Jersey Department of Protection (NJDEP) guideline levels of concern was found throughout the site. In order to administer the Environmental Cleanup Responsibility Act (ECRA) the NJDEP has developed a list of contaminants in soil, which occur frequently, with concentrations at which they become of concern, and at which the NJDEP may require remedial or cleanup action. Most of the surface soil on the site is contaminated with one or more metals down to a depth of about four feet. Contamination does not extend much beyond twelve feet in depth. Contaminants include copper, lead, mercury and zinc.

The contaminants are very slightly soluble in surface water and groundwater with which they are in contact on the site. [redacted]. The routes of dispersion of surficial contaminated soil by wind, water or biota are the only routes of exposure that may be cause for concern.

An additional source of contamination appears to be discharges from the stormwater/sanitary combined sewer of the Town of Kearny, which is located in the ground on the site. Remediation of this environmental problem needs to be addressed in cooperation with the Town of Kearny.

The J. H. Crow Company recommends remedial action which will minimize risks from the contaminated soil. It is recommended that portions of the site, which are not now covered with buildings or paving, be covered with asphalt, or with fabric, which will not pass clay size particles, topped by stones or sod. This mitigation will contain the contaminants in the soil; they will not be able to move via wind, water or biota, and, therefore, their presence will pose an acceptable risk.

INTERSTATE METALS SEPARATING CORP.
Environmental Report

I. ACTIVITIES ON SITE

A. INTRODUCTION

Interstate Metals Separating Corp. reclaims metals. It is in the recycling business. It has been in business at its site in Kearny since 1943. The location of the site is shown on Figure I(1). The site plan is shown in Figure II(1). The operations are described later on in this report.

The company has operated for most of its lifetime during the era before people had became fully aware of environmental concerns. In earlier times, it was an acceptable industrial practice for metal compounds to be used for filling land. The site is located in the Hackensack Meadowlands, close to the foot of the shale outcrop to the west. The site has both upland and marsh. Metal separating operations have been carried out on the upland since 1943 to today. In the early years, metal-bearing materials were washed onto a low-lying area. Then the water would evaporate or drain away, and the material would be shoveled up and sold.
? Residues were left, and gradually this practice made more dry land which was considered a beneficial effect. [It is well known that there are other areas in the Meadowlands which have been filled with metal-bearing waste materials.] - so this makes it ok!?

As the company has become aware of environmental problems that it might be creating by its processes, it has taken appropriate steps to correct the problems. Some of these actions are summarized in this section. These actions have been taken voluntarily, often before regulations have come into effect.

With a growing awareness of the broad ranging effects of current environmental regulations, including ECRA, on business operations, Interstate retained J. H. Crow Company, Inc., environmental consultants, in mid 1986 to assist them in ascertaining environmental conditions and in decisions about the future of the company and its land. The environmental findings show the cumulative effect of nearly a half century of industrial activities of a business that has been and continues to be necessary for the well-being of this society.] - Are we as a society not dependent upon our environment?

B. PRESENT ACTIVITIES

1. Brass Reclamation Operation

The primary operation at Interstate today reclaims brass and other metals from residues obtained from brass mills. Brass is an alloy containing essentially copper and zinc. The residues are fed via a hopper into a chute which feeds into a ball mill. Next the milled raw materials are separated mechanically by a water process into product of three different size particles: fine concentrates, medium concentrates, and large concentrates. The fine concentrates are generally 82-85% metallics, of which 58-60% is copper. The medium sized particles consist of pieces 1/4 inch to 1 inch in size; they contain 90-94% metallics. The large concentrates are 94-98% metallics, of which approximately 60-66% is copper; they range from ring sized to fist sized. Both the fine and medium concentrates go through a rotary dryer, which removes moisture. They then go through a magnet which separates the iron from the brass. Iron is separated out manually from the large concentrates. All these fractions, three sizes of brass pieces and iron, are sold.

Another product of the above process is middlings. These consist of 28-30% copper and 35-40% zinc. Middlings are an essential input material to the metal refining industry.

Yet another product of this process is zinc residues. Their composition is 45-50% zinc, 6-9% copper, various siliceous earth materials, and trace elements. These are fine, silt size particles. They are carried in the water phase. The zinc residues are separated from the water in a concrete settling basin. The supernatant water is released into a recirculating lagoon. The wet zinc residues are dried, and sold as an essential agricultural soil additive.

The water used in the separation operation, after passing through the settling basin, is temporarily stored in the lagoon and then recirculated through the process. The operation requires some make-up water for the water that is lost through evaporation.

Thus, the only wastes from this process are non-metallic materials that are manually removed from the raw materials before they enter the ball mill. They are ID 27 solid wastes. A small amount of material is lost as air-borne dust. The water used is recirculated. The six different types of separated metal-containing solids are all sold as products. For a reclamation process this operation generates remarkably little waste.

Interstate Metals has reduced its inventory to eliminate stockpiles of raw materials for the brass reclamation process. This was done, at substantial economic loss, specifically to minimize the potential risks to the environment through airborne vectoring of dusts.

2. Solder Reclamation Operation

The raw materials consist of scrap gas meters. These are fed manually into a rotary kiln, where they are heated. The melted solder drips into a pan set approximately a third of the way down the belt. The other components continue along the conveyor. Iron and brass are manually sorted out at the end of the conveyor. The following day, the solder is melted down in a crucible and is poured into pig molds. The composition of the solder is approximately 46% tin, 4% antimony, <1% copper. The remainder consists of lead. The solder pigs are sold to customers; the iron, brass, and other separated metal parts of the meters are also sold as product.

Dross from the melted solder is a product of this process. Dross consists of 35% tin and 37% lead. The dross is sold to a smelter or a refinery.

An air scrubber system for the solder sweating operation was installed in the 1960's when air pollution became a concern. It is still in use today. The scrubber system consists of a flooded elbow and a Venturi separator. The blower system forces air with smoke and gases from the furnace by vacuum into the flooded elbow. The system washes out pollutants and forces cleaned air up the stack. The system is cleaned out periodically. The water is recirculated.

The solder reclamation operation, like the brass reclamation operation, generates very little waste material.

C. HISTORY OF OPERATIONS ON SITE

1. Use of Site before Acquisition by Interstate Metals

Prior to 1943, the site was unused. In 1943 Interstate Metals leased the site. Operations on the site were begun in this period. The company has carried out various scrap metal reclamation operations since then. These operations are described below.

2. Solder Reclamation Operation

Sweating solder out of iron or steel equipment (e.g., meters) was started in 1945. At that time, it was run as a batch operation by putting meters mixed with wood shavings in the open top of a drum-shaped container placed in a tilted position. The wood chips were burned, creating a temperature of approximately 400°F. The solder melted from the equipment and dripped into a pan through a hole in the container. Each batch contained 50-70 meters and about 7 batches were run a day.

A new solder sweating system was installed in 1965. This system is still in use, and is described on page 3. Use of the old batch operation equipment ceased at this time, and the equipment was dismantled. At about the same time, an air scrubber system was added to the operation. This scrubber system is also still in operation. Air emissions from this operation have been permitted by the state of New Jersey since installation (current Certificate No. 7992).

3. Composition Slag Separation Process

Also during the 40's and 50's, Interstate separated composition slags. These slags contained approximately 15% of metallics. The composition of this fifteen percent was approximately 85% copper, 5% tin, 5% zinc, and 5% lead. The residue from this water separation was sluiced off to an empty, low-lying part of the property to the north. This sluicing action took place years ago, when environmental consequences were unanticipated. No such sluicing has been done for 30 years.

4. Brass Reclamation Operation

Brass reclamation operations, which continue to the present day, were started in the late 1940's. At that time the water containing the zinc residues was discharged onto the low-lying portion of the site. A berm was constructed around much of the property in the 1940's to help contain the standing water. When much of the water had been removed from the zinc residues by evaporation, draining off, or seeping into the ground, these residues were sold as a low-grade ore for further refining. This practice then became uneconomical, and unsold residues were removed from the site. Sluicing operations ceased in the mid 1960's.

5. Military Material

Around the end of World War II, Interstate Metals acquired aluminum foil which had been used for chaff. This was later buried on-site at the request of the U.S. military.

6. Nickel Alloy Operation

During the 1950's, Interstate processed nickel alloy material containing nickel, copper, and chromium which originated from a plant in Pennsylvania. A higher grade nickel alloy was obtained from another location. This operation was carried out at the Interstate facility in a joint venture by Interstate and another company in New Jersey.

7. Mercury Reclamation Operation

In the late 1950's or early 1960's, certain companies asked Interstate Metals if it could reclaim mercury from mercury-contaminated dirt. Interstate recovered the mercury and returned the residual soils and other wastes to the companies. Residuals from the operation were sluiced onto the vacant low-lying portion of the property. When, during the 1960's it became evident that environmental and health problems might be caused by this operation, the operation ceased.

Some concrete and other wastes containing mercury, which were owned by Interstate's customers, still remained on-site. Interstate asked its former environmental consultant, Total Environmental Services, to make arrangements to dispose of the remaining materials. These wastes were disposed of as solid waste ID 27. Receipts of this transaction are available.

Some mercury-contaminated soil remains on the site. The New Jersey Department of Environmental Protection has been aware of this situation since its inspection in June 1985.

8. Copper Recovery Operation

In 1969, a copper recovery operation was started in which the insulation was burned off copper wire, including ACSR and weather cable. Insulation was also burned off aluminum wire. The burning operation required some 500 gallons of oil per day, so in 1976, when oil prices rose rapidly, this operation was stopped.

D. PRESENT BUSINESS CONDITIONS

The metals which Interstate recycles are as essential to the U.S. economy and society today as they always have been. Natural ores containing these metals have been mined so extensively that the ores now being processed to obtain virgin metal contain much lower concentrations of metal than the ores that were mined when Interstate started operations in the 1940's. In the 1980's the input materials used by Interstate from which metals are separated contain much higher concentrations of metals than most natural ores. The technology for processing low-grade natural ores has kept pace with declining concentrations, but the technology for reclaiming metals has changed very little in the past four decades. The recycling technology in use at Interstate today is "state of the art". The U.S. federal government has a policy of protecting stockpiles of strategic metals. Several of the metals being recycled by Interstate are strategic. Their business cannot but become more important economically in the future.

Also, the need for recycling to protect the environment is now widely recognized. There is evidence for this phenomenon in the recent passage of the Mandatory Recycling Act in New Jersey. For this reason alone, it would seem to be a reasonable public policy to try to maintain the viability of small recycling businesses, such as Interstate Metals Separating Corporation.

However, the U.S. economic structures have been sluggish in responding to what should be an increasing demand for recycled metals. Current sluggishness is indicated by the fact that, in recent years, Interstate has lost several markets in the U.S., and its principal market for brass is now India. If the U.S. pursues its strategic metals policy, then markets in the U.S. should improve in the future.

If Interstate's shipments of brass to India were to be cut off, then both the Indian economy and the U.S. balance of payments would be affected negatively. However, Interstate's profit margin on this operation is close to break even. If the company's costs of operation were to increase, the operation would no longer be economically viable.

If Interstate were to cease operations, risks to the U.S. environment would increase because the materials that are presently recycled by Interstate would become hazardous wastes requiring disposal by others. If Interstate were to close its business, the U.S. economy would also suffer, because there is a need for metal recycling operations, and starting up a new business is usually more expensive than retaining an existing viable business.

II. ENVIRONMENTAL FINDINGS

A. METHODS OF STUDY

Most of the site is barren of vegetation in spite of the fact that the hydrologic regime should be conducive to the growth of wetland and upland vegetation. This phenomenon is frequently evidence of soil contamination. In the first phase of the study, soil borings were taken in the low-lying part of the site. The locations of these borings are shown on Figure II(1), and are labeled A through H. Soil samples were taken at various depths down to eight feet at several locations. They were analyzed for the trace metal elements which have been routinely processed at Interstate since its early days -- copper, zinc, lead, and tin. Tests were also run for the highly toxic elements -- mercury and cadmium. The results of these analyses and more recent sampling are given in Table II(1), which is to be read in conjunction with Figure II(1). As described in section IIB, in all boring locations elevated concentrations of some or all the metals were found in the soil. Also, groundwater was encountered in all borings.

The next questions to be addressed were:

> How has the contamination in the soil affected the ground water quality?
>
> What are the potentials for the metal element contaminants to migrate away from the contaminated soil?

Six shallow and two deeper monitoring wells were installed. Soil samples were obtained from the well bore holes, and then water samples and water levels were taken. Soil borings were made in the upland portion of the site. Also, water samples and sediment samples were taken from the surface water bodies on site: the lagoon for recirculating process water and the pond. All samples were analyzed for copper, zinc, lead, mercury, pH, and specific conductance. Further analyses were not run for tin or cadmium because they were not major components of the first sampling of soils. Chromium analyses were run in some samples because the New Jersey Department of Environmental Protection (NJDEP) had raised a question about the possibility of this element being a contaminant of the site. The results of these investigations are described below.

B. SOIL CONTAMINATION

1. Areal Extent

At all locations on the site where soil samples were taken, concentrations of copper, zinc, lead, and mercury which were above NJDEP acceptable levels were found between the surface and a depth of four feet. All samples of soil taken from the surface down to four feet contained levels of copper in excess of 170 mg/kg, the current NJDEP level of concern, with the exception of boring E at a depth of four feet. The same is true for lead, which has a level of concern of 100 mg/kg. All samples at all locations down to a depth of five feet contained zinc at levels above the level of concern (350 mg/kg). More than three-quarters (78%) of the samples down to a four-foot depth contained mercury at levels above 1 mg/kg, which is the level of concern. The highest concentration of copper above five feet was 64 g/kg, that of lead was 39 g/kg, that of mercury was 35 g/kg, and that of zinc was 445 g/kg, which is 44.5% of the soil. The highest concentration of the four elements (Cu, Pb, Hg, and Zn) found in any soil sample was 60%, which was found at six feet in the boring for monitoring well 3. These data are tabulated in Table II(1). The locations of the borings are shown on Figure II(1). Figures II(2), II(3), II(4), II(5), and II(6) present the data in a different format.

Soil samples were taken from representative areas over most of the site, both the occupied and vacant portions. Thus, it is reasonable to expect that most soils on the site from the surface down to about four feet are contaminated with one or more metal elements. Possible exceptions are the northwest corner of the site and areas underneath the impervious surfaces.

2. Vertical Extent

Data from soil samples taken below four feet depth are also given in Table II(1). These same data are arranged by depth of sample in Table II(2). The means of concentrations for each element at each depth are shown in Table II(3). These averages are shown graphically in Figures II(7) through II(11). Monitoring well 6 was bored to 39 feet below the surface. The combined data from the cluster of wells 6, 7, and 8 are presented in Table II(4) and in Figures II(12) through II(16).

In general, the high levels of contamination taper off between six feet and eight feet deep. At 14 feet and deeper, four of the analyses (only 6%) show a concentration of metallic element above the NJDEP accepted level. These are about two times or less that of the accepted level. They are levels of copper and zinc, which are the least toxic elements of those measured. Three of these samples were from the bottom of the deep borehole for monitoring well 6 where drilling was stopped because a dense clay material was encountered. Between 18 feet and 35 feet in this borehole no soil contamination was found, in spite of the fact that at the two feet depth the weight of the four elements, copper, zinc, lead and mercury, was 13% of the weight of the soil. The data indicate that, although the top six to eight feet of soil over most of the site is contaminated, the contaminants have not migrated much below the twelve-foot depth.

Statistically, there are sufficient data to assume that the copper and zinc levels found between 37 and 39 feet are natural to the native geologic material, clay. Higher levels of these elements are expected to be associated with the small particles of clay (which have greater surface area) than the larger particles of fine sand and silt (with less surface area) which were found between 18 to 35 feet deep. Also, the naturally occurring groundwater of this site is brackish, which has higher concentrations of these elements than fresh water. In summary, the contamination of the soil on site does not appear to extend much beyond twelve feet in depth.

C. HYDROGEOLOGY

1. Geology

The site is located in the Hackensack Meadowlands between the Passaic River and the Hackensack River. Figure I(1) shows its location. The soils from the soil borings were examined for texture and other physical features. Fill materials of various types, mostly inorganic in nature, were found at the surface down to three feet or more. At many locations between three and seven feet there were soils high in organic content, which are called Meadowland mat and are formed from the decomposing vegetation of the marsh. Beneath these were sands and silts of various grain sizes. Then, at the 38-foot depth in borehole 6, dense clay was found. Drilling was stopped at this depth to avoid penetration of a clay barrier to the passage of ground water. How far beneath the clay the shale bedrock lies is not known.

2. Topography

Figure II(17) shows the topography of the site. Elevations range from over six feet above mean sea level (MSL) on the upland portion of the site to below sea level in the storm water pond and lagoon. The minimal variation in elevation on the site (i.e. lack of relief) and its closeness to sea level are physical limitations that severely limit the range of possibilities for remediation of the contamination of the site.

3. <u>Groundwater Elevations</u>

Table II(5) gives the elevation of the water table in the monitoring wells on various dates. During February and March 1987 the elevation was consistently highest in well 2 and lowest in well 5 of the six shallow wells. These six wells (1, 2, 3, 4, 5, and 8) are screened between 2 to 12 feet or 4 to 14 feet, so these levels define the unconfined surface, that is the water table. The highest water elevation measured at monitoring well 2 was 2.2 feet above mean sea level (MSL). The highest at monitoring well 5 was 0.9 feet MSL . Water level contours estimated from these data, from the readings taken on March 9, are shown on Figure II(18). <u>From these data it appears that the flow of groundwater on the site is in a westerly direction. However, there is a very shallow hydraulic gradient.</u> Between monitoring wells 2 and 5 the gradient is 0.0025 vertical feet per horizontal foot. Also the flow is not towards a surface water or ground water outlet. It appears to be towards the uplands, in the direction of the upward trending shale bedrock, which appears to be a hydrogeologic anomaly.

The water levels taken on August 3 show a slightly different pattern. The level in monitoring well 2 was still the highest, followed by monitoring wells 3, 4 and 8, as before. However, the level in monitoring well 1 was lower than that in monitoring well 5. In fact, the level in monitoring well 1 was below sea level. From March to August the general water table dropped about 0.9 feet. This shift was expected because water levels are generally higher in the "wet" season in early spring and lower in the summer from the effects of evapotranspiration. The shift in the lowest level from <u>monitoring well 5 to monitoring well 1,</u> however, was unexpected. [redacted] apparent shift [redacted]w. The August data are also mapped on Figure II(18).

Monitoring well 7 is screened between 15 and 25 feet, and monitoring well 6 from 27 to 37 feet. In spite of the fact that monitoring wells 6, 7, and 8 are placed close together in a cluster, the water elevation in each is different. On March 17, 1987, the level in 8 was 0.8 feet, in 7 it was 0.6 feet and in 6 it was 0.1 feet. This indicates that the three strata of water measured in these wells are not free to move rapidly from one level to another under a hydraulic, or pressure, gradient, whether upwards or downwards. This means that the water strata are separated from each other by geological material of low permeability. Therefore, even under pressure, water moves slowly between strata. In this case, the hydraulic gradient is downward. <u>Groundwater on this site tends to move from the water table, which is the uppermost layer of groundwater, downwards, deeper into the ground. However, its movement downward is impeded effectively by clay layers in the ground.</u> Logs from the various boreholes made on the site support this observation.

The cluster of monitoring wells (6, 7, and 8) was placed where it was hoped that the surface water elevation would be lower than that at monitoring well 5. It is not. But whether the nadir of the water table is closest to monitoring well 5, or 1, or 8, it appears to be in a depression. This means that all groundwater on the site is tending to flow into this depression and thence deeper into the ground. On August 3 the water levels in monitoring wells 7 and 6 were below sea level. This means that the site is hydraulically isolated from the estuary, and that this inflow is possible. If this is the case, then ground water is not migrating off the site at a significant rate. It is seeping very slowly downward. <u>The actual direction of movement of ground water is still not known, but it is reasonable to conclude from the available data that ground water movement beneath the site is very slow.</u>

4. <u>Surface Water Drainage</u>

Surface water moves onto the site from Dukes Street, Tappan Street, Hoyt Street, and Devon Terrace and collects on the low-lying portions. There are sewers carrying overflows from combined storm water and sanitary sewers which enter the site from Dukes Street and Tappan Street in the subsurface. Figure II(19), which is derived from a map from the engineer of the Town of Kearny, shows two pipes, one of ten inch diameter and one of 24 inch diameter, flowing downhill towards the Interstate site on Tappan Street, and one pipe of ten inch diameter moving water uphill. Presumably, the two ten inch pipes are designed to carry sanitary wastewater, and the 24 inch pipe is for storm water. During dry periods most of the wastewater is pumped back up the hill into a pipe on Schuyler Avenue. During and after storms stormwater and raw sewage overflow into a pipe in the ground on the Interstate site. ~~Apparently, a similar piping structure is located where Dukes Street abuts the Interstate property~~. The map also shows the two 24 inch diameter pipes for overflow water crossing the Interstate site, coming together well within the site into a 30 inch diameter pipe, and then exiting the site underneath the railroad tracks.

However, during and following storms, it has been observed that water polluted with oil and other materials seeps up to the surface in the middle of the Interstate site along the sewer right-of-way where the pipe is 30 inches. <u>It is apparent that oil and other pollutants are coming onto the site by way of the sewer.</u> We assume that the pipe is not carrying all the storm water and sewage off of the site, that at least part of it empties onto the site. (It should be noted that this pollution is coming from off-site, and that the Town of Kearny is responsible for the maintenance of its sewerage system.)

Storm water also runs off the property to the northeast of Interstate (block 252, lot 4B) and from areas further north onto the Interstate property. The Conrail embankment to the east is a barrier that interferes with water running off the Interstate property to the east and south. There is piping through the embankment that allows the passage of some water from the site.

There may be an outflow for surface water from the Interstate site to the northeast via the channel indicated on the topographic map, Figure II(17). However, the bottom of that channel is not very many inches above sea level, and we have observed water moving onto the site towards the pond, instead of away from the pond. The direction water flows in that channel is probably determined by the difference between the elevation of storm water in the pond and the elevation of tidal water in the Meadowlands. Thus, there probably are times when water can only move onto the site. The flow of surface water appears to alternate between away from the site and onto the site. Because the site is so close to sea level there are problems with managing storm water that would not occur on sites at higher elevations. For some remedial solutions, there is the problem either that flooding would be worsened, or that storm water would have to be directed to a site lower than the Interstate site. Such a site might have to be below sea level where the sea is held back.

We have been informed that, when this site was first developed, there were sea flood gates which physically kept tidal water off the site. They held back the sea. However, these flood gates have not been maintained, and they are no longer functional. The sea is no longer held back, so, flooding at the Interstate site is now perennial.

D. GROUNDWATER QUALITY

Data from the analyses of ground water samples taken from the monitoring wells, as well as the data from the soils associated with the water in these samples, are given in Table II(6). Monitoring wells 1, 2, and 8 were screened at 4 to 14 feet. Monitoring wells 3, 4, and 5 were screened at 2 to 12 feet. Concentrations in water samples from these wells are an integrated function of the solubilities of the various materials with which the water is in contact over this distance. As the data show, the concentrations of a given element in the soils are highly variable throughout this distance. The data from the analysis of water from these wells indicate that the solubilities of the compounds which contain the contaminating elements are quite low, and that many of the levels are less than maximum contaminant levels required for potable water.

In the six monitoring well samples, all concentrations of copper (Cu), mercury (Hg), and zinc (Zn) were below the maximum contaminant levels of 1.0 mg/l, 0.002 mg/l, and 5.0 mg/l, respectively. However, lead (Pb) was above 0.05 mg/l in monitoring wells 1, 2, and 3. The highest level of lead was found in monitoring well 1; it was 290 mg/l, which is 5.8 times greater than permitted for potable water. Chromium (Cr) levels in five of the six wells were above the maximum contaminant level of 0.05 mg/l, but the highest level was only 4.9 times that of the permissible limit for drinking water.

The ratio of the concentration of a particular element in soil to that in water from samples taken in close proximity to each other is high in all but one of the 32 pairs of samples reported on Table II(6). In ten of the pairs of soil/water samples the element was not detected in the water sample. In 21 of the pairs the ratio ranged from 0.7 million to 250 times greater in soil than in water. In only one case, lead was not detected in the soil, but was detected in the water.

Thus, in spite of the high levels of the contaminants in the soils in which these water samples were in contact, about three quarters of the analyses showed levels indicating potability. None of the levels of lead or chromium above the potability standards, by themselves, would be toxic for humans. Furthermore, this water is not used for drinking water and probably never will be.

Water pumped from monitoring well 6, which is screened at the 27 to 37 feet depth, and well 7, which is screened between 15 and 25 feet, was clearer than the near surface samples. No analysis contained an element at a concentration above its standard.

Thus, groundwater from the interstices of highly contaminated soil was only minimally contaminated. The deeper groundwater was not contaminated at all. The data show that the contaminants are virtually immobile in the soil, are not migrating downward in the groundwater, and, therefore, are not contaminating the groundwater.

E. SURFACE WATER QUALITY

Data from six surface water samples taken from the lagoon, which is used for recirculating water used in the brass separation process, and from the storm water pond are also given in Table II(6). In two of the pond water samples, all concentrations measured were less than the standards. The pond sample taken in the area of very high soil contamination had slightly elevated concentrations of lead and mercury. Each of the three lagoon samples had elevated lead concentrations of six times the standard or less. Although this water can not be considered to be uncontaminated, the concentrations in water are surprisingly low compared to those in the sediments (soil) of the lagoon and pond. The concentration of a particular element in a sediment sample compared to that in a water sample taken nearby is high in all cases. The range in 21 pairs of samples is from 9.5 thousand to 27 million times greater in soil than in water.

F. OTHER ENVIRONMENTAL IMPACTS

1. Air

a. Aeolian (Wind-blown) Transport of Contaminated Soil

The contaminated soils on the surface of the ground and the outdoor piles of raw materials and products are subject to being blown by the winds. The movement of solid particles by wind from raw material and product piles is minimized by wetting down the piles and limiting the number of piles on-site. In the open vacant areas of the site the aggregation of soil materials is good and blowing does not appear to be a significant problem.

b. Emissions from Solder Sweating Operation

Data from the Occupational Safety and Health Administration (OSHA) indicate that this operation is managed so that the low exposure of the workers to lead fumes is acceptable. Lead and other emissions from the stack are appropriately regulated by a New Jersey Department of Environmental Protection air quality permit.

2. Biota

At present the Interstate site presents relatively low risks to humans because exposure is low and the health effects are not acute. Exposure is low because it is a controlled industrial site with a few workers allowed on site. Obviously, people do not drink the water, or eat the soil on-site. The principal risks to people are from breathing contaminated particles or eating food that has come into contact with particles. These risks are minimized by the workers on the site taking appropriate precautions, which conform to OSHA (Occupational Safety and Health Administration) regulations and guidelines. Interstate has an active OSHA program. It has been inspected by OSHA personnel during 1987, and it is in compliance.

However, the risks to other types of biota, or organisms, are more extensive. There is virtually no vegetation on the site, which means that the soil is probably toxic to plants and, in all likelihood, most microorganisms. The climate, geology, topography and location of the site suggest that the site was, in the past, a rich marshland habitat with plentiful, and possibly diverse, wildlife. In fact there is marshland on the adjacent site to the northeast (Block 252, Lot 4B), and many types of birds are visitors to the pond area of the Interstate site. What the effects of the contamination on site have been to birds and other wildlife are not known. We would recommend that the use of this land, in so far as practicable, remain industrial, as it has been zoned for decades. ~~We see no need for its conversion back to a wildlife sanctuary~~. Suggested remediation will minimize the risks to whatever wildlife or domesticated life might visit the site and its environs in the future.

III. REMEDIAL ACTION

A. ENVIRONMENTAL HAZARDS REQUIRING REMEDIAL ACTION

The presence of soil contaminated with various toxic metallic compounds on much of the site makes remedial action advisable. If the site were allowed to remain as is, then air-borne and, possibly, water-borne migration of contaminants would persist. Workers, trespassers, birds, and mammals may be exposed to elevated levels of lead, cadmium, mercury, or other substances. The risks from the contamination would be reduced if the contaminants are restricted from migrating off-site and coming into contact with animals.

Interstate has already taken the precaution of installing a fence around the low-lying area including the pond. This greatly reduces the risk of trespassers entering the site. The upland area has been fenced for many years. There is at least one person on site as watchman for twenty-four hours per day and seven days per week.

The owners of Interstate recognize that the risks posed by the contaminated soil on site must be reduced, and have acted forthrightly to do so. J. H. Crow Company was retained to assess the risks and then to study and evaluate remedial actions to reduce these risks. In the next two sections a number of alternatives are discussed. Finally, one recommended alternative is described, and the reasons for its selection are given.

B. POSSIBLE REMEDIAL ACTIONS

1. Types of Alternatives

Other than the "laissez faire", that is the no action, alternative, which is less than satisfactory, there are three conceptually different remedial actions to consider. These are:

Removal of contaminated soil from site;

Removal of contaminating materials from soil;

Encapsulation of contaminating materials.

Each of these means of trying to reduce hazards is considered in this section.

2. Removal of Contaminated Soil from Site

To assure virtually complete removal of the contaminated soil from the site it would be necessary to strip the soil from the entire site of over eight acres down to a depth of twelve feet. That is about 160,000 cubic yards of soil. It would mean that the buildings now on site would have to be demolished. Digging up the soil and demolishing the buildings would stir up dust and cause some of the contaminants to be spread by air currents and by the equipment and workers on the site. Even if the soil were dry, there is no licensed waste depository in New Jersey which could accept this soil. It would have to be trucked out of state over long distances in many truckloads. The risk of escape of the contaminated soil into an uncontaminated environment caused by a truck accident while on the road is at least proportional to the number of miles traveled. Assuming that the contaminated soil could be safely trucked to a legal hazardous waste depository, the cost of this remedial action would be prohibitive (several millions of dollars).

Furthermore, since the water table is less than twelve feet below the surface at all points on the site, removal of the soil would entail excavation well into the water table to depths beneath sea level. Much of the soil would be wet, and there is no legal depository for wet soil. Drying the soil would add many millions of dollars to the cost, if it could be done.

Without filling the site afterward, it would be a lake with brackish water which would be completely unusable, and structures on surrounding properties would eventually be undermined. With filling, the site would be slightly usable, but primarily for water storage. This course of action is not recommended.

3. Removal of Contaminants from Soil

The value of the metals in the compounds which contaminate the soil would be high if they could be reacted and separated from the other components of the soil. [redacted]er. Unfortunately, technologies are not now available for recovering the metals from the soil in any practical way.

Theoretically, the remedial action of choice would be to convert the wastes to resources. Soil contamination by metallic compounds is a common occurrence. It would be prudent for society to develop the necessary technologies to be able to clean up this site and others by removing the contaminants from the soil. In the hope that society will pursue this objective, we suggest that the remedial action chosen at this time be one which will allow recovery of the mineral resources in the soil at some future time.

Since neither removal of the contaminated soil nor removal of the contaminants is feasible, containment of the contaminants is the only viable conceptual alternative.

4. Encapsulation

a. Purposes of Encapsulation

The primary purposes of encapsulation, that is containment, of the contaminated soil would be:

To reduce release of contaminants to the environment by air-borne transport.

To reduce release of contaminants by surface water movement.

To reduce exposure of biota to contaminants.

Secondary purposes would be:

To allow some usage of the land.

EITHER to contain the contaminated soil so that the mineral resources in it are available in the future for reclamation;
OR to allow for a very gradual, long term process of dispersion into the environment so the ecologic consequences are minimized during transition, and so that the site eventually reaches a less contaminated, more usable state.

(As noted above, our preference is to contain the contaminants so that they may eventually be recycled.)

The familiar goal of reducing leaching of storm water through contaminated soils into groundwater was considered and not used. This goal was abandoned, because the analyses of water quality indicate that leaching of the contaminants into the groundwater is not posing significant increased environmental risk, and because the hydrology of the site makes achievement of this purpose very difficult. The hydrologic difficulties are discussed below.

b. Extent of Encapsulation

(i) Areal extent:

The contaminated soils on the surface should probably be capped over the entire site for reasons mentioned above. In this discussion the term "capping" means covering, and it does not specify any particular scheme or technical approach.

(ii) Vertical extent:

There is no need for vertical barriers in the ground to prevent migration of contaminants laterally off-site. This is because the flow of groundwater on the site is virtually nil in both horizontal and vertical directions, and the concentrations of contaminants below 12 feet depth are at acceptable levels. (See section II.)

c. Concerns with Encapsulation and the Hydrologic Regime

For the cap to inhibit the movement of storm water into ground water through the contaminated soil on site, the cap would have to be of low permeability, and the stormwater running onto the site and precipitated on the site would have to be prevented from seeping beneath the cap. Thus, a low permeability cap should be located at the bottom of an on-site stormwater detention basin. In order to be located above the water table on site, the bottom of this capping layer should be at least one foot above sea level and preferably two feet above sea level. The paving for the parking in the back of the box factory, the western end of the low-lying portion of the site, is less than two feet above sea level in the area near MW5.

The perpetual pond on the Interstate site now functions as a stormwater detention basin for runoff from an area of unknown size. The natural runoff area may extend as far west as Devon Street (which is west of Schuyler Avenue), an area of approximately 51 acres. Some of the runoff from the adjacent site to the northeast runs onto the Interstate site. The adjacent site is 4.9 acres; ~~the Interstate site is 8.4 acres~~. Thus, historically, the Interstate site could have handled run-off water from a drainage area as large as 64 acres. Currently, much of this water is diverted elsewhere through Kearny's combined sewer system, which carries both sewage and storm water. However, during sizable storms, the sewers, by design, overflow into sewer pipes in the ground of the Interstate site. See Figure II(19). Apparently one of these sewer pipes leaks, because polluted water comes to the surface of the site, above where a sewer pipe is supposed to be located, during and after storms.

As noted above, to separate surface water from ground water, the cap and the bottom of the water storage basin should be provided at or above two feet above MSL. Assuming that the bottom of the stormwater basin is located at an elevation of 2.5 feet, and assuming that only a portion of the site is to be inundated by water, the top of the stormwater storage basin probably might not be more than 4.5 feet above MSL. Further, assuming that about half of the Interstate property were to be used for a basin, the capacity of the basin would be about eight acre-feet. Such a stormwater detention basin could not contain the runoff in a hundred-year storm from 64 acres or even 20 acres.

Furthermore, there presently is uncertainty about how water outflows from the site. If the basin were to accept much more water than currently runs onto the site, a method for discharging the water from the basin might need to be found. One way to achieve this would be to pump the water through a pipe to a receiving body of water at an elevation lower than 2.5 feet. ~~The closest stream is the Passaic River, which at its closest point is approximately 0.7 miles from the site~~. The route to this nearest point of the Passaic River would run south along the north-south Conrail line, which is adjacent to Interstate Metals Separating Corporation, and cross the east-west Conrail line, Harrison Avenue, Route I-280, and the main switching yards of Conrail.

The properties adjacent to Interstate to the west slope uphill to a high at Devon Street of about 60 feet. If the bottom of the storm water detention basin were to be above the water table, regardless of whether or not the basin were to be enclosed up to 4.5 feet on this western boundary, stormwater runoff would back up more than at present into the buildings on Dukes Street, Tappan Street, Hoyt Street, and Devon Terrace.

Unless blocked off, the sewers, that run down Dukes Street and Tappan Street and empty overflows of combined sanitary and storm water into sewers in the ground of the Interstate site, will continue to dump water into the contaminated soil beneath the cap. If the cap were of low permeability to prevent storm water from leaching the contaminated soil, this would defeat the purpose of the cap. This sewer water is contaminated itself, so its continued discharge into the Interstate site will further aggravate the contamination situation on site.

If the sewers were blocked, the water flow in these sewers could be discharged into the Interstate detention basin, or onto Dukes Street and Tappan Street. Diversion to the basin would exacerbate the problems with the detention basin. Diversion to the streets would further aggravate the flooding problems in this area. Interstate can not unilaterally remedy the problems created by the water management system of the Town of Kearny. How to address the bad flooding problems that presently exist on the Interstate site and its environs, and the sewer problems need further study. This study needs the participation of the Town of Kearny and Hudson County.

C. EVALUATION OF ALTERNATIVE METHODS OF CAPPING SITE

1. Minimal Capping of Upland Portion of Site

The upland portion of the site, that is the area above four feet in elevation where the buildings and activities are located, could be capped. Capping would be done by the placement of macadam, or other low permeability material, which would hold the soil in place, on all areas of normal human access which are not already covered with buildings, concrete, or asphalt. Water from the paved areas would be directed towards the vacant area.

If the topography of the site were left unchanged, then water would run into and out of the pond as it now does, except that there would be some increased runoff from the active portion of the site because of the increase in impervious cover. The water level in the pond might be higher on average. During and following storms, flooding problems would be likely to increase. It is not anticipated that either surface water or ground water quality would be worsened by this alternative. The near surface ground water is minimally, if at all, contaminated now, and the deeper ground water appears to be protected from contamination by the overlying unconsolidated sediments in the formation underlying the meadowlands, and the relative insolubility of the inorganic contaminants in the soil. Capping of the developed area only would decrease the amount of sediment and solutes that run off into the pond. Thus, the rate of filling of the pond by sediments would be slower, and the carry-over of sediments and solutes into outflow from the site would be lower than at present.

The principal problem with this approach is the fact that contaminated soil would be left exposed so that it would be moved by wind and water, and so that it would impose risks for animals, including humans, which are on or near the unprotected portion of the site. In our view the greatest risks would be from breathing or ingesting contaminated dust particles. The risks from ingesting water are less. Because the site is so contaminated, vegetation does not grow appreciably, so the risks from ingestion of contaminated plants are minimal.

2. <u>Capping of Upland Portion and Coverage with Water of Low-lying Portion</u>

This option would require recontouring of portions of the property (primarily the open, undeveloped area). There would be no net removal of contaminated soil. The principal objectives of recontouring would be as follows:

> To create a pond with a flat bottom and berms where needed so that water is at a uniform depth at all points in the pond at any one time and so that there is water in the pond at all times.
>
> To develop manageable upland areas.

All areas of the site, except for the bottom of the pond, would then be capped with a material such as asphalt.

This method allows percolation of water into and out of the ground water through the pond. Because migration of contaminants in the ground water, both vertically and horizontally, is, according to our findings, very limited, and because the ground water is not used by humans directly, this alternative should be acceptable as far as ground water quality is concerned. Its advantage over the previous method of leaving contaminated soil exposed to the air is that air-borne routes of exposure to the contaminants are eliminated. Its disadvantage is that contaminants would still be able to migrate freely in the surface water.

3. <u>Capping of Upland Portion with Wetland Formation in Low-lying Portion</u>

This alternative is similar to that above (2), except in place of the pond a wetland environment would be created. If the soil on this site were not contaminated, the low-lying areas would now be wetlands with a smaller pond. In this scenario, the site would be recontoured as above with the flat bottom of the low-lying area at an elevation of 0 feet or, perhaps, a bit below sea level. Then the bottom of the low area, which probably would contain water, and part way up the sides of the slopes and berms would be covered with a layer of clean loam, perhaps a foot thick. This would cover the contaminated soil so that it would no longer be exposed to wind, surface water, humans, or wildlife.

This area would then be planted with hardy wetland species which grow readily in the meadowlands to get wetland propagation started. The area would need protective care for a few years until a natural succession is started, and, thereafter, to protect it from dumping and other human incursions. Although the subsoil would still be poisonous to plants, it is anticipated that with sufficient nutrients in the surface soil the number of species able to survive would form a healthy wetland ecosystem. Please note that the net movements would be eluvial and the fresh soil should not become as contaminated as below.

The re-establishment of microbiota in the soil might increase the solubility and, thus, mobility of some of the heavy metals by the formation of metal/organic complexes. The free exchange between surface and ground water would continue, and the formation of metal/organic compounds would hasten the inevitable dispersion trend. We do not anticipate that this would cause an increase in environmental degradation as compared to that which is now occurring, and that the environmental effects on the environs of the site would probably be as salutary as capping the entire site with impervious material so that ground water and surface water are separated from each other. From a scientific perspective, whatever alternative is chosen, it would be useful to monitor the after-effects of that remedial action.

The particular advantages to this approach are as follows:

> Water would be removed from the site by evapotranspiration as well as by outflow into surface and ground water. Evaporated or transpired water would be clean of the heavy metal contaminants found on the site. In an actively growing wetland ecosystem, well over half of the water precipitated on or flowing into the system can be removed from the system by evapotranspiration.
>
> A variety of mechanisms in the ecosystem help to cleanse the water flowing through the system of pollutants, including heavy metals. Whether or not this created wetland would be able to assimilate the pollutants entering the site via storm water sewers is not known now. The land would have to be maintained as a conservation area.

As for the upland portion of the site, all remaining area not covered with clean soil or other type of capping could be capped with macadam or other impervious surfacing and used as at present or for some other industrial use.

Another alternative would be to cover the upland as well with good topsoil and then vegetate it. This would create an integrated conservation area in which the upland might be used for park land. However, the land uses surrounding the Interstate site would make this use of the land out of place. Because of its prime location with respect to transportation, and its proximity to urban centers, the upland portion of this site should continue in an industrial use, in our considered judgment.

The prime disadvantage to this alternative is the uncertainty of its outcome. Too little is known to predict how well such a created wetland would grow, and how much the contaminants would be mobilized by the biota in the wetland ecosystem.

4. Low-permeability Capping of Entire Site with Minimal Water Storage

To prevent further infiltration of surface water into the ground water in order to minimize future mobility of soil contaminants in the ground water and to prevent their entry into surface water, the entire site should be capped with impervious material. The recontouring of the site would be similar to that described previously for alternative 2. Then all exposed surfaces of the soil of the site would be covered with a material of low permeability, such as asphalt. In the low-lying area there would be a storm water detention basin, which could be either wet or dry. Asphalt would not be a good material for a wet basin because it would break up easily under conditions where water would be acting on the material from both above and beneath. For the basin to be dry, its bottom would need to be located above the water table, that is about 2.5 feet above sea level. Assuming that the upland elevation is 4.5 feet or more, then there would be about 2.0 feet of storage capacity in the basin. Minimal storage capacity implies that only precipitation on the site itself would be stored temporarily in the basin. If half the site were to be detention basin, then it could hold 1.0 foot of rain, which is more than enough to contain the 100 year storm.

However, at present this site receives storm runoff from a much larger area than the site itself. The water flows onto the site from Dukes Street, Tappan Street, Hoyt Street, and Devon Terrace. This water can be kept off the site by berming the site, where necessary, to a height of about 5 feet along the western property boundary. This should not have a major impact on Dukes Street. The berm from Tappan Street to Devon Terrace could be made wide enough to accommodate some car parking spaces. Such a berm would cause storm water to back up onto these streets and into the neighboring buildings.

Storm water also runs off onto the site from Block 252, lot 4B, which lies to the northeast of the site, and water sometimes flows off the Interstate site onto this adjoining property. It would be prudent not to berm the northeastern property line. This adds an additional drainage area into the detention basin of about 4 acres. This would diminish the storage capacity of the basin to a storm of about 8 inches.

There is another outside source of storm water which enters the site: the in-ground storm sewers that run down Dukes Street and Tappan Street, which are combined on site and then empty into the ground water of the site. (Sanitary and storm water sewer plans for this area show a pipe leading away from the site. However, debris from the sewers has been known to accumulate on-site after rainfall).

This alternative is based on the premise that all remedial action will be undertaken by the owners of the site without recourse to requests for action by public agencies, such as the Town of Kearny which is responsible for the storm sewers. Given that premise, then nothing would be done to alter the storm water sewer system on site. It would continue to function as at present. It would introduce new surface water into the ground where contaminated soils are located, thus dispersing the contaminants. This partially defeats the purpose of the impermeable layer of material between surface and ground water.

Furthermore, the water from the storm sewers would continue to flow to the surface on the Interstate site during or following heavy storms. This would probably cause buckling and break up of the macadam surface of the detention basin. This deterioration of the detention basin would be hastened by the dissolving action of petroleum hydrocarbons frequently found in the storm sewer runoff.

The additional water from the storm sewers would increase the amount of storm water to be stored in the detention basin. What its actual capacity would be, probably can not be predetermined. However, it is reasonable to assume that the basin, in order to contain the 100 year storm, would have to have a considerably larger capacity than the 8.4 acre-feet, which was assumed at the start of this discussion to be more than adequate. A larger basin could be designed, but it would not solve the qualitative problems of the 8.4 acre-feet design.

Another problem might arise. Whether or not the outflow of the basin would be sufficient to keep the basin dry is not known. If water were to accumulate so the basin were continually wet, then asphalt would be an inadequate membrane material, and water levels in the surrounding buildings and streets would be higher than they are at present.

In order for water to evaporate from the basin, the basin could not be covered over with a structure. This means that only about one third of the land would be usable.

5. <u>Low-permeability Capping of Entire Site with Moderate Water Storage</u>

This alternative attempts to correct most of the deficiencies of the previous alternative (4) by using the following techniques:

Creation of a detention basin with a larger capacity;

Creation of a wet basin instead of a dry basin;

Separation of ground water from surface water through use of a more flexible membrane material;

Piping storm water sewer flows to the surface.

The basin would be made larger by lowering the bottom of the basin to about 0.5 feet above mean sea level, raising the elevation of the upland portion to about 6 feet above sea level, and using the land to the east of the solder sweating operation for basin. For calculation purposes we assume that two-thirds of the site would be used for detention basin, that is 5.6 acres.

The basin would be designed to be wet so that it could be cut down into the present water table. If surface water no longer percolated from the site into ground water then the ground water table would decline to about sea level. The impermeable membrane between the bottom of the basin and the ground water might be set as low as from 0 to 0.5 feet above MSL. If the bottom of the outlet weir were to be set at 1.0 feet above MSL, then the basin would usually have six inches of water in it. If the rest of the perimeter of the basin were built at 6 feet, then the detention capacity of the basin would be 28 acre-feet. This might be enough capacity to accommodate the runoff from all present sources onto the site in a 100 year storm. Another advantage of a wet basin is that water removal from the site would occur by the process of evaporation during a greater part of the year than it would in a dry basin.

The encapsulation material used in this alternative to separate the surface water from the ground water would have to be flexible enough to withstand water pressures from both beneath and above the low permeability membrane, and would have to be thin enough to maximize the basin capacity. Asphalt does not have these properties. A fiber-reinforced plastic material that would resist deterioration by petroleum hydrocarbons might be used. To protect the plastic from shear forces and from abrasion from below, the plastic might be placed atop a layer of a type of clay which would have a low permeability when saturated with the ground water on the site, which has a relatively high ionic content. To protect the plastic from abrasion and shear forces from above, perhaps an upper layer of clay would work. The capping material on all upland areas and on areas in the basin which are usually dry could still be asphalt.

To avoid radical alteration of the topography of the western boundary of the site and the adjacent streets, a ditch could be constructed on the western side of the basin berm to collect the runoff from the streets. The water collecting in the ditch would then be pumped over the berm into the basin.

With cooperation from the Town of Kearny, the water in the storm water sewers would be piped so that it would empty into the wet detention basin. The pollutants in this water would be a problem because they would increase sedimentation in the basin and would probably augment algal and plant growth in the basin. The filling of the basin with sediment would decrease its capacity. The growth of plants with tap roots puncturing the plastic would slowly increase the exchange of water between surface and ground. If these were considered to be problems, then they could be corrected by the following remedies:

> The sedimentation problem could be corrected by periodic removal of the sediments in the bottom of the basin and maintenance of the clay and plastic membrane bottom.
>
> Plant growth in the basin could be inhibited by coverage of the basin so that light would not get to plants. Coverage of the basin could be done by constructing a structure above it built on stilt piles. The structure could be used for parking, warehousing, or any other industrial use. A cheaper but less useful means of coverage of the water in the basin would be to float black plastic on the water surface. Coverage of the basin would, of course, decrease the amount of water that would exit by evaporation.

If the consequences of sedimentation and plant growth were not considered to be problems, then gradually the membrane would become porous and the basin would become a vegetated wetland. If this is the ultimate goal, then it should be directly encouraged by using alternative 2, rather than this one. We do not believe that the interim effects on the environs of the Interstate site would differ very much.

In order to cover two-thirds of the site with a water detention basin, then there would be substantially less usable land than with other alternatives. Another disadvantage of this alternative is its high cost both for construction and maintenance. Furthermore, it is not certain that it could be maintained satisfactorily.

6. Low-permeability Capping of Entire Site with Water Removal

If water were to be pumped away from the surface of the site, then storm water runoff could be managed on-site in a much smaller volume than required in the passive removal systems envisaged in alternatives described above. Any such mechanical system would, however, have several disadvantages which are described below:

It would require large expenditures for equipment and operation. A major expense in the operation of an active system is for energy.

It would require on-going maintenance to a much greater extent than any other option described.

It would require a place to which the water could be displaced.

The detention basin could be designed in any of the ways previously described. A pump in the basin would automatically start operating when water reached a predetermined elevation. The water would then be pumped through pipes to wherever it would be discharged. The pump system might not be very expensive, but the piping system, depending upon its length and the terrain through which it would have to pass, could be extremely costly.

The runoff onto this site would not be clean water. It would be polluted with petroleum hydrocarbons, dirt, and other debris from urban streets, and many other materials. Thus, the pump and pipes would require periodic cleaning and maintenance. Breakdown of equipment during a storm would also be a problem.

However, where to discharge the water is the fundamental problem with this alternative. The Passaic River to the south, where it is at a slightly lower elevation than the site, is more than two-thirds of a miles away. The nearest creek to the northeast can flow towards the site as well as away from it, as already noted. Perhaps, if the water were pumped through the railroad embankment, its backward flow towards the site would be slow enough for effective removal, but a complex hydrologic study would be needed to confirm this. Pumping the water into the ground on site would, of course, defeat the purpose of putting down a barrier of low permeability between the surface water and the ground water.

Finally, the costs of this alternative would be exorbitant, and there would be no redeeming social benefits.

D. RECOMMENDED REMEDIAL ACTION

Consideration of the encapsulation alternatives described in section C, and others, leads to the conclusion that none of them would adequately meet the purposes for capping set forth in section III.B.3.1. There is, however, an alternative which satisfactorily meets those objectives. This remedial action is <u>impervious capping of heavily used upland portion of the site and porous capping of low-lying and lesser used areas</u>.

The problem of capping the low-lying areas of the site with material of low permeability, such as clay or asphalt, is alluded to in the descriptions of alternatives 4, 5, and 6. The problem is that an impervious layer of material where water occurs both above and below the layer does not allow for equalization of hydrostatic pressures across the layer. For instance, during and after storms, when the detention basin contains water, there would be a net downward pressure on the impervious layer which would tend to be disruptive of the impervious layer. If the layer were placed so that it would be in the ground water part of the time, then during dry periods the net water pressure would be upwards. This would also place unbalanced forces on the layer. The forces on the membrane layer would be highly variable and would eventually cause any material to break up and to lose its low permeability.

This problem is an inevitable consequence of choosing a capping material with low permeability. If a material with moderate permeability were chosen, then the hydrostatic forces would become balanced in relatively short periods of time. This would eliminate the problem. The reason for suggesting that low permeability material be used was to prevent percolation of storm water through the contaminated soil. However, where the soil is already saturated with water it has been shown that the water contains low levels of the contaminants. These levels would be unlikely to cause increased risks to ecosystems into which the water might move, such as the meadowlands and the Passaic/Hackensack estuarine waters. Furthermore, the data on ground water elevations indicate that movement of water off site or deeper into the subsurface material is minimal. Most of the water that presently percolates into the contaminated soil from the pond or lagoon probably remains on site, unless evaporated. Therefore, in areas which are not heavily trafficked, <u>there is no need for capping with low-permeability material</u>. (Where there is heavy traffic the capping material used would be of low permeability because the high strength materials needed have low permeabilities.) What is needed in the other areas is a material through which silt and clay size soil particles do not pass. Such a material would severely limit the movement of even the smallest contaminated soil particles by wind or water or animals; it can be porous to water and air; it would allow rapid equalization of hydrostatic forces and barometric pressures; it would be useful in protecting the environment by holding the contaminated soil on this site.

This type of cap would allow water to move through it but would restrict the movement of contaminated soil into surface water and into air. Some of the advantages of this type of cap follow:

> Hydrostatic forces are equalized;
>
> Volume required for control of storm water is less than would be required with impervious cap because storm water can percolate into ground water;
>
> Detention basin bottom can be lower than ground water table elevation, so brim, that is upper, elevation can be lower than would be required with impervious cap;
>
> Greater amount of site would be upland portion, and, therefore, available for use;
>
> Flooding of surrounding sites, as well as this site, would not be increased;
>
> It would be relatively maintenance free.

In our opinion this approach would minimize all relevant environmental risks.

The firm of Willis & Paul Engineers was consulted to aid in the design of a remedial plan for the site using this approach. Our joint plan recognizes four types of areas which we propose to treat individually. These areas are shown on Figure III(1). They are as follows:

Type of Area	Approximate Site Acreage
1. Existing buildings and appurtenances	0.5
2. Inundated area of brackish water (pond)	1.5
3. Area reserved for parking, loading and circulation of vehicles	1.6
4. All other areas not included in 1, 2 and 3 above	4.9
	===
Total site acreage	8.5

As stated in the report by Willis & Paul Engineers, we recommend that these areas be treated as follows:

> Area #1 (existing buildings and appurtenances) needs no treatment. These areas act in a containment fashion in their current existence.
>
> Area #2 (inundated area of brackish water), which is the largest area of the pond normally inundated, should be sealed with a porous filter fabric overlaid with riprap (a blanket of stone), for anchorage and erosion control. This riprap should be of a size which will remain stable under tidal influence. The filter fabric should have a fabric weight of approximately 8 ounces per square yard and be resistant to oxidation, bacteria and the contaminated soil (e.g. copper, mercury, zinc, lead and chromium). The placement of this fabric and stone would be most efficient after berming the inlets/outlets of the basin and dewatering. Nominal grading could occur at this time if necessary.
>
> Area #3 (parking, driveway, etc.) might best be sealed by performing some minor grading, followed by paving with bituminous concrete. The Town of Kearny typically requires 2 inches of Bituminous Concrete Surface Course Mix I-4 over 2 inches of Bituminous Stabilized Base Course Mix I-2 over 6 inches of Dense Graded Aggregate Base Course. This method will both prevent soil migration and stabilize the area for parking, driveways and loading of heavy trucks.
>
> Area #4 (areas other than #1, 2 and 3), the remaining area, consists of open space on the site not occupied by buildings, parking, driveways or water bodies. This area should be regraded to provide for free drainage, overlaid by a filter fabric whose weight exceeds 4.2 ounces per square yard, then covered with a minimum of 4 inches of topsoil from an off-site source further stabilized by fertilizing, seeding and straw mulching.

The recirculating lagoon is not included in the areas described above. It does not require capping.[1] The problems posed by the municipal combined sewer which runs through the site need to be addressed.

There are a few minor environmental concerns which this method of capping the site would introduce. These concerns, which are described below, would need to be addressed.

> The capping in areas #2, 3 and 4 require adding material on top of the existing contaminated soil. This will add about 3.5 acre-feet of volume to the site. The impacts of this addition should be considered from the point of view of stormwater management.
>
> Area #3 to be covered with bituminous concrete, an area of about 1.6 acres, will be less permeable than at present. Thus runoff from this area will increase.
>
> In area #2, the pond, the fabric will be covered with stones. Gradually the sediment from runoff will accumulate in the interstices of the stones, and plants may start to grow. If plants put roots through the fabric into the contaminated soil, then they may disrupt the fabric or pick up toxic elements into themselves. [A maintenance program, to keep plant growth down, needs to be developed.] interesting idea
>
> In area #4 (remaining areas) sod is to be placed atop the fabric to protect the fabric from abrasion and the elements of weather, particularly sunlight. To reduce the potential problems with plants mentioned above, the soil layer needs to be thick enough so the grass roots do not penetrate the fabric, and the grass needs to be well maintained so that other plants with deeper roots do not grow.

In our professional opinion these environmental concerns can be more readily addressed satisfactorily than the concomitant concerns for any of the other alternatives. Furthermore, we feel that this remedial alternative, both in the short term and long term, will provide overall the best environmental benefits for the state of New Jersey.

<u>We recommend this alternative as the remedial action of choice.</u>

NOTE

[1] According to the data from the deep monitoring wells (Table II(1)B on page 5 of the tables), which are close to the lagoon, the recirculating lagoon is not a source of groundwater contamination. Capping the lagoon would appear to be unnecessary. The only outlet for liquid water from the lagoon is back into the brass separating operation, and not into surface water. Seepage into groundwater is unlikely because hydrostatic forces across the water-soil interface of the lagoon are equal, and because the soil part of that interface is composed of very fine particles of clay and silt size which have a low permeability. To lay fabric in the lagoon would be without benefit, because suspended solids in the recirculating water would continue to settle out in the lagoon and cover the top of the fabric with the same material that would be beneath it.

IV. CONCLUSIONS AND RECOMMENDATION

From our environmental findings we make the following conclusions:

1. Most soils on the site from the surface down to about four feet are contaminated with one or more metal elements. The most prevalent contaminants are zinc, copper and lead.

2. The metal contaminants in the soil are not found at levels of concern much below 12 feet below the surface.

3. The ground water table beneath the surface of the site is essentially flat with slopes on the order of 0.25%. This means that groundwater moves very slowly.

4. The predominant direction of flow of the groundwater is westerly.

5. There are pressure differentials which cause the groundwater to move downward, but it moves very slowly because it is impeded by layers of low permeability silty clay.

6. The groundwater moves very slowly in a direction that tends to be westerly and downwards towards the impervious bedrock. To the best of our knowledge there is no place where this water can outflow away from beneath the site. Therefore, we conclude that the groundwater beneath the site essentially remains there, stagnant.

7. The flow of surface water appears to alternate between away from the site and onto the site due to tidal action.

8. There is a discharge of polluted water from the combined storm water and sanitary water sewer system of the Town of Kearny onto the surface of the Interstate site.

9. Groundwater taken from wells, which are screened down to 12 or 14 feet deep, was only minimally contaminated based on drinking water regulations.

10. Groundwater taken from deeper levels was not contaminated according to the standards for potable water.

11. Surface water samples were either not contaminated or minimally contaminated.

12. There is a minor amount of air-borne migration of the contaminated soil.

13. There may be some risk to animals on the site from the contaminated soil.

Based on these findings, we recommend that remedial action be taken. The only feasible type of remediation, which will not increase environmental risks, is a form of partial encapsulation.

Our proposal is to cover heavily trafficked areas, which are not now covered with impervious surfacing, with asphalt. We propose to cover the remaining areas of the site with polyester filter-fabric. This fabric cover would help hold even the contaminated clay particles in place. These covers on the soil surface would virtually eliminate migration of contaminated soil particles by air or animals. Since the contaminants are almost insoluble in water, and since little water leaves the site, migration of the contaminants in water is very slight at present. The covers will restrict water migration even further. The fabric covers will be held in place under water by stone rip-rap, and on land by sod.

This remedy will effectively limit environmental risks from the soil contaminated with metallic materials. However, it will not solve the problems posed by the pollution coming from the town's stormwater/wastewater management system. We recommend that Interstate cooperate with the Town of Kearny and Hudson County, so that a remedy can also be found for this environmental risk.

We find that the proposed remedial action will provide the most environmental benefits of any alternative.

TABLE II(1)

INTERSTATE METALS SEPARATING CORP.:
A. SOIL DATA

MAP SITE	SAMPLE ID	SAMPLE DATE	DEPTH in.	pH su	CONDUCT. umhos/cm	Cu mg/kg	Pb mg/kg	Hg mg/kg	Zn mg/kg	TOTAL mg/kg	Cd mg/kg	Sn mg/kg	PHC mg/kg	Cr, mg/kg
1	MW1-0	21-Jan-87	24	7.40	240	1550.0	7400.0	7.560	48500.0	57458				
1	MW1-2	21-Jan-87	48	7.63	285	272.0	757.0	1.790	2720.0	3751				
1	MW1-6	21-Jan-87	72	7.48	180	59.5	32.6	U	2200.0	2292				
1	MW1-8	21-Jan-87	96	8.01	150	9.2	6.1	U	25.9	41				
1	MW1-10	21-Jan-87	120	7.91	135	30.8	38.3	U	58.5	128				
1	MW1-12	21-Jan-87	144	7.83	100	9.3	6.5	U	31.2	47				
1	MW1-14	21-Jan-87	168	7.78	130	12.1	6.2	U	59.5	78				
2	MW2-0	22-Jan-87	6	7.84	880	47200.0	18360.0	39.300	123000.0	188599				
2	MW2-3	22-Jan-87	36	9.72	1300	4870.0	1400.0	2.620	28900.0	35173				
2	MW2-4	22-Jan-87	48	10.94	840	11900.0	3490.0	0.310	61800.0	77190				
2	MW2-6	22-Jan-87	72	8.79	720	22900.0	9850.0	3.640	98000.0	130754				
2	MW2-10	22-Jan-87	120	8.69	510	539.0	302.0	0.124	5120.0	5961				
2	MW2-12	22-Jan-87	144	8.36	390	242.0	109.0	U	2410.0	2761				
2	MW2-14	22-Jan-87	168	8.33	285	39.6	14.9	U	152.0	207				
3	MW3-2	28-Jan-87	24	10.83	5000	18700.0	12600.0	159.000	77000.0	108459				
3	MW3-4	28-Jan-87	48	9.67	1300	10700.0	3970.0	3.490	21600.0	36273				
3	MW3-6	28-Jan-87	72	9.40	900	64300.0	20700.0	0.892	514000.0	599001				
3	MW3-8	28-Jan-87	96	7.85	300	62.0	24.8	U	460.0	547				
3	MW3-10	28-Jan-87	120	7.80	350	135.0	56.2	U	515.0	706				
3	MW3-12	28-Jan-87	144	7.89	420	11.9	8.2	U	38.9	59				
4	MW4-4	28-Jan-87	48	7.76	400	18700.0	4700.0	11.100	45200.0	68611				
4	MW4-5	28-Jan-87	60	7.46	350	190.0	672.0	1.860	1630.0	2494				
4	MW4-6	28-Jan-87	72	6.85	590	1700.0	314.0	1.780	3770.0	5786				
4	MW4-8	28-Jan-87	96	7.60	300	215.0	54.7	0.116	894.0	1164				
4	MW4-10	28-Jan-87	120	8.45	400	58.7	15.7	0.108	1970.0	2045				
4	MW4-12	28-Jan-87	144	8.14	310	520.0	93.0	0.230	1890.0	2503				
5	MW5-2	29-Jan-87	24	8.14	400	6060.0	2880.0	0.580	29500.0	38441				
5	MW5-3	29-Jan-87	36	8.38	300	10200.0	3530.0	7.350	39600.0	53337				
5	MW5-4	29-Jan-87	48	8.51	440	5600.0	1130.0	1.150	34400.0	41131				
5	MW5-6	29-Jan-87	72	8.74	400	29.1	16.5	U	241.0	287				

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TABLE II(1)

INTERSTATE METALS SEPARATING CORP.:
A. SOIL DATA

MAP SITE	SAMPLE ID	SAMPLE DATE	DEPTH in.'	pH su	CONDUCT. umhos/cm	Cu mg/kg	Pb mg/kg	Hg mg/kg	Zn mg/kg	TOTAL mg/kg	Cd mg/kg	Sn mg/kg	PHC mg/kg	Cr mg/kg
5	MW5-8	29-Jan-87	96	8.93	410	126.0	41.0	U	796.0	963				
5	MW5-10	29-Jan-87	120	8.56	425	12.7	12.2	U	79.1	104				
5	MW5-12	29-Jan-87	144	8.38	475	182.0	61.8	U	883.0	1127				
6	MW6-2	03-Mar-87	24	7.67	300	14700.0	4900.0	55.300	110000.0	129655				106.0
6	MW6-4	03-Mar-87	48	9.17	410	7300.0	7800.0	0.322	22100.0	37200				68.1
6	MW6-6	03-Mar-87	72	8.18	900	1960.0	460.0	0.46	9650.0	12070				24.7
6	MW6-8	03-Mar-87	96	8.55	440	18.6	4.7	U	63.5	87				8.4
6	MW6-10	03-Mar-87	120	8.51	590	120.0	5.6	U	320.0	446				7.6
6	MW6-14	03-Mar-87	168	8.52	440	130.0	8.6	U	270.0	409				9.1
6	MW6-16	03-Mar-87	192	7.96	610	34.4	U	U	580.0	614				4.2
6	MW6-18	03-Mar-87	216	8.55	600	25.5	U	U	79.5	105				7.0
6	MW6-20	03-Mar-87	240	8.46	460	23.2	U	U	45.8	69				4.4
6	MW6-24	03-Mar-87	288	8.14	590	15.0	U	U	44.0	59				4.6
6	MW6-28	03-Mar-87	336	8.44	570	25.3	3.7	U	104.0	133				9.9
6	MW6-35	03-Mar-87	420	8.27	500	66.6	7.4	U	308.0	382				5.1
6	MW6-40C	03-Mar-87	444	9.37	680	130.0	14.0	U	490.0	634				9.8
6	MW6-40B	03-Mar-87	456	9.30	660	50.7	8.5	0.13	180.0	239				11.2
6	MW6-40A	03-Mar-87	468	9.10	550	210.0	22.1	U	710.0	942				8.7
7	MW7-12	04-Mar-87	144	8.65	450	120.0	21.9	U	600.0	742				8.2
7	MW7-14	04-Mar-87	168	8.37	580	29.6	6.2	U	160.0	196				8.5
8	MW8-14	04-Mar-87	168	8.36	560	28.5	5.2	U	140.0	174				8.5
A	5A	03-Sep-86	6	8.41	250	291.0	242.0	0.782	800.0	1334	1.06	U	43	
A	5B	03-Sep-86	24	8.19	300	398.0	163.0	1.650	540.0	1103	0.65	U		
A	5C	03-Sep-86	48	9.02	675	347.0	264.0	1.350	2290.0	2902	1.59	U		
A	5D	03-Sep-86	72	8.15	300	12.7	U	U	34.4	47	U	U		
B	12A	03-Sep-86	6	8.79	700	13400.0	8500.0	390.000	59000.0	81290	8.91	215		
B	12B	03-Sep-86	24	9.21	775	16000.0	3600.0	118.000	40000	59718	10.10	75		
B	12C	03-Sep-86	48	8.23	1600	1520.0	830.0	17.800	7860	10228	4.67	U		
B	12D	03-Sep-86	72	8.70	650	8.6	U	U	35.6	44	U	U		
B	12E	03-Sep-86	96	8.81	750	104.0	39.4	2.000	481	626	U	U		

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TABLE II(1)

INTERSTATE METALS SEPARATING CORP.:
A. SOIL DATA

MAP SITE	SAMPLE ID	SAMPLE DATE	DEPTH in.	pH su	CONDUCT. umhos/cm	Cu mg/kg	Pb mg/kg	Hg mg/kg	Zn mg/kg	TOTAL mg/kg	Cd mg/kg	Sn mg/kg	PHC mg/kg	Cr mg/kg
C	11A	03-Sep-86	6	9.61	2100	35500.0	5560.0	2240.000	72300.0	115600	15.60	420		
C	11B	03-Sep-86	24	9.22	900	39900.0	21100.0	2160.000	69600.0	132760	25.40	275		
C	11C	03-Sep-86	48	9.83	1100	17900.0	38600.0	4.500	116000.0	172505	32.30	87		
C	11D	03-Sep-86	72	8.52	825	45.2	9.9	0.654	198.0	254	0.30	U		
C	11E	03-Sep-86	96	8.64	550	1950.0	309.0	134.000	14300.0	16693	2.57	U		
D	4A	03-Sep-86	6	10.16	1550	17400.0	3700.0	33.400	50000.0	71133	50.60	217		
D	4B	03-Sep-86	24	9.72	1020	4700.0	15800.0	U	445000.0	465500	414.00	71		
D	4C	03-Sep-86	48	9.64	1300	64000.0	8300.0	0.478	320000.0	392300	173.00	150		
D	4CD	03-Sep-86	60	8.64	1700	512.0	80.0	0.648	28500.0	29093	53.30	U		
D	4E	03-Sep-86	96	8.45	400	32.6	4.5	U	207.0	244	U	U		
E	6A	03-Sep-86	6	11.03	1300	11800.0	3180.0	63.900	19000.0	34044	7.57	233	U	
E	6B	03-Sep-86	24	11.55	1000	3600.0	1145.0	2.750	11500.0	16248	7.63	69		
E	6BC	03-Sep-86	36	10.23	550	3500.0	1100.0	1.590	16900.0	21502	6.68	52		
E	6C	03-Sep-86	48	10.59	500	110.0	48.8	0.396	750.0	909	3.60	U		
E	6D	03-Sep-86	72	6.99	320	238.0	524.0	5.660	1380.0	2148	2.62	U		
E	6E	03-Sep-86	96	7.63	410	83.2	22.0	1.080	340.0	446	U	U		
F	8A	03-Sep-86	6	8.93	1500	37300.0	7000.0	178.000	119000.0	163478	117.00	500		
F	8B	03-Sep-86	14	8.59	800	3800.0	1240.0	4.900	64400.0	69445	1.89	200		
F	8C	03-Sep-86	22	7.95	1100	5260.0	1620.0	0.521	63600.0	70481	7.31	170		
F	8D	03-Sep-86	24	6.88	3000	20900.0	7600.0	8.210	119000.0	147508	97.10	114		
F	8E	03-Sep-86	30	8.00	1650	14300.0	7130.0	4.140	157000.0	178434	180.00	367		
G	9B	03-Sep-86	24	8.78	1150	8100.0	1660.0	12.100	65000.0	74772	10.10	345		
G	9C	03-Sep-86	48	7.75	1700	297.0	538.0	4.270	1790.0	2629	6.28	U		
G	9D	03-Sep-86	72	7.10	1000	18.8	8.9	U	180.0	208	0.41	U		
G	9E	03-Sep-86	96	8.06	1000	6.8	U	U	207.0	214	U	U		
H	10A	03-Sep-86	6	8.63	450	20700.0	3200.0	3470.000	56200.0	83570	8.12	1015		
H	10B	03-Sep-86	24	9.11	850	2050.0	1100.0	7.560	13500.0	16658	17.70	85		
H	10C	03-Sep-86	48	9.11	500	19100.0	4500.0	1.850	98100.0	121702	7.40	72		
H	10CD	03-Sep-86	60	7.95	300	205.0	230.0	3.020	950.0	1388	U	U		
H	10D	03-Sep-86	72	7.67	800	1100.0	170.0	5.840	2400.0	3676	2.45	U		

INTERSTATE METALS SEPARATING CORP.:
A. SOIL DATA

MAP SITE	SAMPLE ID	SAMPLE DATE	DEPTH in.	pH su	CONDUCT. umhos/cm	Cu mg/kg	Pb mg/kg	Hg mg/kg	Zn mg/kg	TOTAL mg/kg	Cd mg/kg	Sn mg/kg	PHC mg/kg	Cr mg/kg
H	10E	03-Sep-86	96	8.65	500	1450.0	324.0	11.400	7120.0	8905	5.47	26		
I	B1-2	29-Jan-87	24	9.00	640	938.0	13800.0	3.450	4270.0	19011				
I	B1-4	29-Jan-87	48	8.14	710	1470.0	464.0	0.412	5630.0	7564				
I	B1-6	29-Jan-87	72	8.16	490	830.0	613.0	0.526	3040.0	4484				
I	B1-8	29-Jan-87	96	8.10	510	345.0	1670.0	0.345	2930.0	4945				
I	B1-10	29-Jan-87	120	7.99	330	11.6	12.0	U	41.1	65				
J	B2-2	29-Jan-87	24	8.13	1010	1380.0	2480.0	3.120	2580.0	6443				
J	B2-4	29-Jan-87	48	8.20	1400	363.0	2630.0	0.440	1410.0	4403				
J	B2-6	29-Jan-87	72	8.24	1150	1700.0	2320.0	0.799	2570.0	6591				
J	B2-7	29-Jan-87	84	7.88	300	10.7	18.5	U	37.1	66				
J	B2-8	29-Jan-87	96	7.80	350	15.2	30.0	U	67.2	112				
J	B2-10	29-Jan-87	120	8.21	410	49.7	52.0	U	169.0	271				
U	LS-1	04-Mar-87	6	9.63	2000	45000.0	14000.0	190	290000.0	349190				90.8
V	LS-2	04-Mar-87	6	9.89	1500	92000.0	11000.0	56.2	300000.0	403056				38.2
W	LS-3	04-Mar-87	6	9.48	1510	38000.0	5200.0	61.3	270000.0	313261				45.4
X	PS-1	04-Mar-87	6	8.68	900	1800.0	6000.0	780	68000.0	76580				87.4
Y	PS-2	04-Mar-87	6	9.43	450	30000.0	11000.0	11.4	21000.0	62011				41.6
Z	PS-3	04-Mar-87	6	8.69	590	20000.0	6700.0	41.6	62000.0	88742				160.0

INTERSTATE METALS SEPARATING CORP.:
B. WATER DATA

MAP SITE	SAMPLE ID	SAMPLE DATE	pH su	CONDUCT. umhos/cm	Cu mg/L	Pb mg/L	Hg mg/L	Zn mg/L	TOTAL mg/L	Cd mg/L	Cr mg/L
1	MW1	05-Feb-87	7.45	630	U	0.290	U	0.270	0.560		0.127
2	MW2	05-Feb-87	8.41	1280	0.050	0.062	U	0.820	0.932		0.112
3	MW3	05-Feb-87	9.87	1800	0.510	0.055	U	0.150	0.715		0.166
4	MW4	05-Feb-87	7.63	1750	0.070	0.042	U	2.100	2.212		0.243
5	MW5	05-Feb-87	8.04	2200	0.110	0.042	U	0.280	0.432		0.122
6	MW6	17-Mar-87	8.29	2500	U	0.016	U	0.320	0.336	0.003	U
7	MW7	17-Mar-87	8.18	2400	0.080	0.041	U	0.750	0.871	0.003	U
8	MW8	17-Mar-87	8.27	2500	0.080	0.017	U	0.320	0.417	0.001	U
U	LW-1	04-Mar-87	10.02	3500	0.300	0.237	U	0.070	0.607		U
V	LW-2	04-Mar-87	10.08	3600	0.410	0.304	U	0.070	0.784		U
W	LW-3	04-Mar-87	10.07	3500	0.260	0.141	U	0.010	0.411		U
X	PW-1	04-Mar-87	8.48	790	0.130	0.136	0.004	0.480	0.750		U
Y	PW-2	04-Mar-87	8.69	400	0.070	0.027	0.001	0.170	0.268		U
Z	PW-3	04-Mar-87	8.68	400	0.430	0.044	0.001	0.070	0.545		U

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TABLE II(2)

INTERSTATE METALS SEPARATING CORP.:
SOILS DATA SORTED BY DEPTH

MAP SITE	DEPTH in.	pH su	CONDUCT. umhos/cm	Cu mg/kg	Pb mg/kg	Hg mg/kg	Zn mg/kg	TOTAL mg/kg	Cd mg/kg	Sn mg/kg	Cr mg/kg
2	6	7.84	880	47200.0	18360.0	39.300	123000.0	188599	-		
A	6	8.41	250	291.0	242.0	0.782	800.0	1334	1.06	U	
B	6	8.79	700	13400.0	8500.0	390.000	59000.0	81290	8.91	215	
C	6	9.61	2100	35500.0	5560.0	2240.000	72300.0	115600	15.60	420	
D	6	10.16	1550	17400.0	3700.0	33.400	50000.0	71133	50.60	217	
E	6	11.03	1300	11800.0	3180.0	63.900	19000.0	34044	7.57	233	
F	6	8.93	1500	37300.0	7000.0	178.000	119000.0	163478	117.00	500	
H	6	8.63	450	20700.0	3200.0	3470.000	56200.0	83570	8.12	1015	
U	6	9.63	2000	45000.0	14000.0	190	290000.0	349190			90.8
V	6	9.89	1500	92000.0	11000.0	56.2	300000.0	403056			38.2
W	6	9.48	1510	38000.0	5200.0	61.3	270000.0	313261			45.4
X	6	8.68	900	1800.0	6000.0	780	68000.0	76580			87.4
Y	6	9.43	450	30000.0	11000.0	11.4	21000.0	62011			41.6
Z	6	8.69	590	20000.0	6700.0	41.6	62000.0	88742			160.0
F	14	8.59	800	3800.0	1240.0	4.900	64400.0	69445	1.89	200	
F	22	7.95	1100	5260.0	1620.0	0.521	63600.0	70481	7.31	170	
1	24	7.40	240	1550.0	7400.0	7.560	48500.0	57458			
3	24	10.83	5000	18700.0	12600.0	159.000	77000.0	108459			
5	24	8.14	400	6060.0	2880.0	0.580	29500.0	38441			
6	24	7.67	300	14700.0	4900.0	55.300	110000.0	129655			106.0
A	24	8.19	300	398.0	163.0	1.650	540.0	1103	0.65	U	
B	24	9.21	775	16000.0	3600.0	118.000	40000	59718	10.10	75	
C	24	9.22	900	39900.0	21100.0	2160.000	69600.0	132760	25.40	275	
D	24	9.72	1020	4700.0	15800.0	U	445000.0	465500	414.00	71	
E	24	11.55	1000	3600.0	1145.0	2.750	11500.0	16248	7.63	69	
F	24	6.88	3000	20900.0	7600.0	8.210	119000.0	147508	97.10	114	
G	24	8.78	1150	8100.0	1660.0	12.100	65000.0	74772	10.10	345	
H	24	9.11	850	2050.0	1100.0	7.560	13500.0	16658	17.70	85	
I	24	9.00	640	938.0	13800.0	3.450	4270.0	19011			
J	24	8.13	1010	1380.0	2480.0	3.120	2580.0	6443			
F	30	8.00	1650	14300.0	7130.0	4.140	157000.0	178434	180.00	367	
2	36	9.72	1300	4870.0	1400.0	2.620	28900.0	35173			
5	36	8.38	300	10200.0	3530.0	7.350	39600.0	53337			
E	36	10.23	550	3500.0	1100.0	1.590	16900.0	21502	6.68	52	
1	48	7.63	285	272.0	757.0	1.790	2720.0	3751			
2	48	10.94	840	11900.0	3490.0	0.310	61800.0	77190			
3	48	9.67	1300	10700.0	3970.0	3.490	21600.0	36273			
4	48	7.76	400	18700.0	4700.0	11.100	45200.0	68611			
5	48	8.51	440	5600.0	1130.0	1.150	34400.0	41131			
6	48	9.17	410	7300.0	7800.0	0.322	22100.0	37200			68.1
A	48	9.02	675	347.0	264.0	1.350	2290.0	2902	1.59	U	
B	48	8.23	1600	1520.0	830.0	17.800	7860	10228	4.67	U	
C	48	9.83	1100	17900.0	38600.0	4.500	116000.0	172505	32.30	87	
D	48	9.64	1300	64000.0	8300.0	0.478	320000.0	392300	173.00	150	
E	48	10.59	500	110.0	48.8	0.396	750.0	909	3.60	U	
G	48	7.75	1700	297.0	538.0	4.270	1790.0	2629	6.28	U	

INTERSTATE METALS SEPARATING CORP.:
SOILS DATA SORTED BY DEPTH

MAP SITE	DEPTH in.	pH su	CONDUCT. umhos/cm	Cu mg/kg	Pb mg/kg	Hg mg/kg	Zn mg/kg	TOTAL mg/kg	Cd mg/kg	Sn mg/kg	Cr mg/kg
H	48	9.11	500	19100.0	4500.0	1.850	98100.0	121702	7.40	72	
I	48	8.14	710	1470.0	464.0	0.412	5630.0	7564			
J	48	8.20	1400	363.0	2630.0	0.440	1410.0	4403			
4	60	7.46	350	190.0	672.0	1.860	1630.0	2494			
D	60	8.64	1700	512.0	80.0	0.648	28500.0	29093	53.30	U	
H	60	7.95	300	205.0	230.0	3.020	950.0	1388	U	U	
1	72	7.48	180	59.5	32.6	U	2200.0	2292			
2	72	8.79	720	22900.0	9850.0	3.640	98000.0	130754			
3	72	9.40	900	64300.0	20700.0	0.892	514000.0	599001			
4	72	6.85	590	1700.0	314.0	1.780	3770.0	5786			
5	72	8.74	400	29.1	16.5	U	241.0	287			
6	72	8.18	900	1960.0	460.0	0.46	9650.0	12070			24.7
A	72	8.15	300	12.7	U	U	34.4	47	U	U	
B	72	8.70	650	8.6	U	U	35.6	44	U	U	
C	72	8.52	825	45.2	9.9	0.654	198.0	254	0.30	U	
E	72	6.99	320	238.0	524.0	5.660	1380.0	2148	2.62	U	
G	72	7.10	1000	18.8	8.9	U	180.0	208	0.41	U	
H	72	7.67	800	1100.0	170.0	5.840	2400.0	3676	2.45	U	
I	72	8.16	490	830.0	613.0	0.526	3040.0	4484			
J	72	8.24	1150	1700.0	2320.0	0.799	2570.0	6591			
J	84	7.88	300	10.7	18.5	U	37.1	66			
1	96	8.01	150	9.2	6.1	U	25.9	41			
3	96	7.85	300	62.0	24.8	U	460.0	547			
4	96	7.60	300	215.0	54.7	0.116	894.0	1164			
5	96	8.93	410	126.0	41.0	U	796.0	963			
6	96	8.55	440	18.6	4.7	U	63.5	87			8.4
B	96	8.81	750	104.0	39.4	2.000	481	626	U	U	
C	96	8.64	550	1950.0	309.0	134.000	14300.0	16693	2.57	U	
D	96	8.45	400	32.6	4.5	U	207.0	244	U	U	
E	96	7.63	410	83.2	22.0	1.080	340.0	446	U	U	
G	96	8.06	1000	6.8	U	U	207.0	214	U	U	
H	96	8.65	500	1450.0	324.0	11.400	7120.0	8905	5.47	26	
I	96	8.10	510	345.0	1670.0	0.345	2930.0	4945			
J	96	7.80	350	15.2	30.0	U	67.2	112			
1	120	7.91	135	30.8	38.3	U	58.5	128			
2	120	8.69	510	539.0	302.0	0.124	5120.0	5961			
3	120	7.80	350	135.0	56.2	U	515.0	706			
4	120	8.45	400	58.7	15.7	0.108	1970.0	2045			
5	120	8.56	425	12.7	12.2	U	79.1	104			
6	120	8.51	590	120.0	5.6	U	320.0	446			7.6
I	120	7.99	330	11.6	12.0	U	41.1	65			
J	120	8.21	410	49.7	52.0	U	169.0	271			
1	144	7.83	100	9.3	6.5	U	31.2	47			
2	144	8.36	390	242.0	109.0	U	2410.0	2761			
3	144	7.89	420	11.9	8.2	U	38.9	59			
4	144	8.14	310	520.0	93.0	0.230	1890.0	2503			

TABLE II(2)

INTERSTATE METALS SEPARATING CORP.:
SOILS DATA SORTED BY DEPTH

MAP SITE	DEPTH in.	pH su	CONDUCT. umhos/cm	Cu mg/kg	Pb mg/kg	Hg mg/kg	Zn mg/kg	TOTAL mg/kg	Cd mg/kg	Sn mg/kg	Cr mg/kg
5	144	8.38	475	182.0	61.8	U	883.0	1127			
7	144	8.65	450	120.0	21.9	U	600.0	742			8.2
1	168	7.78	130	12.1	6.2	U	59.5	78			
2	168	8.33	285	39.6	14.9	U	152.0	207			
6	168	8.52	440	130.0	8.6	U	270.0	409			9.1
7	168	8.37	580	29.6	6.2	U	160.0	196			8.5
8	168	8.36	560	28.5	5.2	U	140.0	174			8.5
6	192	7.96	610	34.4	U	U	580.0	614			4.2
6	216	8.55	600	25.5	U	U	79.5	105			7.0
6	240	8.46	460	23.2	U	U	45.8	69			4.4
6	288	8.14	590	15.0	U	U	44.0	59			4.6
6	336	8.44	570	25.3	3.7	U	104.0	133			9.9
6	420	8.27	500	66.6	7.4	U	308.0	382			5.1
6	444	9.37	680	130.0	14.0	U	490.0	634			9.8
6	456	9.30	660	50.7	8.5	0.13	180.0	239			11.2
6	468	9.10	550	210.0	22.1	U	710.0	942			8.7

TABLE II(3)

INTERSTATE METALS SEPARATING CORP.:
A. SOIL STATISTICS BY DEPTH AND MEDIUM

SAMPLE TYPE	DEPTH inches	STATISTIC	pH su	CONDUCT. umhos/cm	Cu mg/kg	Pb mg/kg	Hg mg/kg	Zn mg/kg	TOTAL mg/kg	Cd mg/kg	Sn mg/kg	PHC mg/kg	Cr mg/L
SOIL	6	N	14	14	14	14	14	14	14	7	7	2	6
		MEAN	9.23	1120.00	29313.64	7403.00	539.71	107878.57	145134.92	29.84	371.43	21.50	77.23
		STD	0.79	573.90	22576.38	4644.68	993.71	98922.18	119725.40	38.66	302.02	21.50	42.71
		STD/MEAN	0.09	0.51	0.77	0.63	1.84	0.92	0.82	1.30	0.81	1.00	0.55
SOIL	24	N	16	16	16	16	16	16	16	10	10		1
		MEAN	8.77	1155.31	9252.25	6193.00	159.04	72749.38	88353.67	59.19	140.40		106.00
		STD	1.17	1167.73	10216.33	6143.08	518.62	102457.04	107359.78	121.27	101.03		0.00
		STD/MEAN	0.13	1.01	1.10	0.99	3.26	1.41	1.22	2.05	0.72		0.00
SOIL	36	N	4	4	4	4	4	4	4	2	2		
		MEAN	9.08	950.00	8217.50	3290.00	3.93	60600.00	72111.43	93.34	209.50		
		STD	0.92	546.58	4312.41	2406.83	2.18	56232.86	62415.58	86.66	157.50		
		STD/MEAN	0.10	0.58	0.52	0.73	0.55	0.93	0.87	0.93	0.75		
SOIL	48	N	15	15	15	15	15	15	15	7	7		1
		MEAN	8.95	877.33	10638.60	5201.45	3.31	49443.33	65286.70	32.69	44.14		68.10
		STD	1.00	463.50	15872.12	9288.62	4.74	80383.43	99934.04	58.09	55.57		0.00
		STD/MEAN	0.11	0.53	1.49	1.79	1.43	1.63	1.53	1.78	1.26		0.00
SOIL	60	N	3	3	3	3	3	3	3	2			
		MEAN	8.02	783.33	302.33	327.33	1.84	10360.00	10991.51	26.65			
		STD	0.48	648.50	148.38	251.29	0.97	12829.92	12807.40	26.65			
		STD/MEAN	0.06	0.83	0.49	0.77	0.53	1.24	1.17	1.00			
SOIL	72	N	14	14	14	14	14	14	14	6			
		MEAN	8.07	658.93	6778.71	2501.35	1.45	45549.93	54831.43	0.96			
		STD	0.73	280.10	16960.40	5633.39	1.99	132257.51	154474.70	1.12			
		STD/MEAN	0.09	0.43	2.50	2.25	1.38	2.90	2.82	1.16			

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TABLE II(3)

INTERSTATE METALS SEPARATING CORP.:
A. SOIL STATISTICS BY DEPTH AND MEDIUM

SAMPLE TYPE	DEPTH inches	STATISTIC	pH su	CONDUCT. umhos/cm	Cu mg/kg	Pb mg/kg	Hg mg/kg	Zn mg/kg	TOTAL mg/kg	Cd mg/kg	Sn mg/kg	PHC mg/kg	Cr mg/L
SOIL	96	N	14	14	14	14	14	14	14	6	6		
		MEAN	8.21	455.00	316.31	182.05	10.64	1994.91	2503.90	1.34	4.33		
		STD	0.43	203.81	579.96	425.44	34.34	3874.29	4613.25	2.07	9.69		
		STD/MEAN	0.05	0.45	1.83	2.34	3.23	1.94	1.84	1.55	2.24		
SOIL	120	N	8	8	8	8	8	8	8				
		MEAN	8.27	393.75	119.69	61.75	0.03	1034.09	1215.56				
		STD	0.31	125.62	164.20	92.60	0.05	1656.36	1893.95				
		STD/MEAN	0.04	0.32	1.37	1.50	1.74	1.60	1.56				
SOIL	144	N	6	6	6	6	6	6	6				
		MEAN	8.21	357.50	180.87	50.06	0.04	975.52	1206.49				
		STD	0.29	126.42	173.42	40.62	0.09	895.60	1078.69				
		STD/MEAN	0.04	0.35	0.96	0.81	2.24	0.92	0.89				
SOIL	168	N	5	5	5	5	5	5	5				3
		MEAN	8.27	399.00	47.96	8.20		156.30	212.46				8.68
		STD	0.25	170.72	41.96	3.53		67.22	108.08				0.32
		STD/MEAN	0.03	0.43	0.87	0.43		0.43	0.51				0.04
SOIL	192-468	N	9	9	9	9	9	9	9				9
		MEAN	8.62	580.00	64.52	6.19	0.01	282.37	353.09				7.22
		STD	0.48	66.33	61.26	7.31	0.04	238.39	295.35				2.58
		STD/MEAN	0.06	0.11	0.95	1.18	2.83	0.84	0.84				0.36

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TABLE II(3)

INTERSTATE METALS SEPARATING CORP.:
B. WATER STATISTICS BY DEPTH

SAMPLE TYPE	DEPTH inches		pH su	CONDUCT. umhos/cm	Cu mg/L	Pb mg/L	Hg mg/L	Zn mg/L	TOTAL mg/L	Cd mg/L	Sn mg/L	PHC mg/L	Cr mg/L
WATER	SURFACE	N	6	6	6	6	6	6	6				
		MEAN	9.34	2031.67	0.27	0.15	0.00	0.15	0.56				
		STD	0.72	1507.65	0.13	0.10	0.00	0.16	0.18				
		STD/MEAN	0.08	0.74	0.50	0.66	1.27	1.08	0.32				
WATER	WELL TO 168 IN. MAX	N	6	6	6	6		6	6				6
		MEAN	8.28	1693.33	0.14	0.08		0.66	0.88				0.13
		STD	0.79	608.76	0.17	0.09		0.68	0.62				0.07
		STD/MEAN	0.10	0.36	1.25	1.10		1.03	0.71				0.56
WATER	WELL, DEEP	N	2	2	2	2		2	2				
		MEAN	8.24	2450.00	0.04	0.03		0.54	0.60				
		STD	0.06	50.00	0.04	0.01		0.22	0.27				
		STD/MEAN	0.01	0.02	1.00	0.44		0.40	0.44				

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TABLE II(3)

INTERSTATE METALS SEPARATING CORP.:
C. SUMMARY OF MEANS OF SOILS DATA BY DEPTH

DEPTH feet	pH su	CONDUCT. umhos/cm	Cu mg/kg	Cu Cu/170	Pb mg/kg	Pb Pb/100	Hg mg/kg	Hg Hg/1	Zn mg/kg	Zn Zn/350	TOTAL mg/kg	TOTAL g/kg
0.5	9.23	1120.00	29313.64	172.43	7403.00	74.03	539.71	539.71	107878.57	308.22	145134.92	145.13
2	8.77	1155.31	9252.25	54.43	6193.00	61.93	159.04	159.04	72749.38	207.86	88353.67	88.35
3	9.08	950.00	8217.50	48.34	3290.00	32.90	3.93	3.93	60600.00	173.14	72111.43	72.11
4	8.95	877.33	10638.60	62.58	5201.45	52.01	3.31	3.31	49443.33	141.27	65286.70	65.29
6	8.07	658.93	6778.71	39.87	2501.35	25.01	1.45	1.45	45549.93	130.14	54831.43	54.83
8	8.21	455.00	316.31	1.86	182.05	1.82	10.64	10.64	1994.91	5.70	2503.90	2.50
10	8.27	393.75	119.69	0.70	61.75	0.62	0.03	0.03	1034.09	2.95	1215.56	1.22
12	8.21	357.50	180.87	1.06	50.06	0.50	0.04	0.04	975.52	2.79	1206.49	1.21
14	8.27	399.00	47.96	0.28	8.20	0.08		0.00	156.30	0.45	212.46	0.21

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TABLE II(3)

INTERSTATE METALS SEPARATING CORP.:
C. SUMMARY OF MEANS OF SOILS DATA BY DEPTH

DEPTH feet	Cd mg/kg	Sn mg/kg	PHC mg/kg	Cr mg/L
0.5	29.84	371.43	21.50	77.23
2	59.19	140.40		106.00
3	93.34	209.50		
4	32.69	44.14		68.10
6	0.96			
8	1.34	4.33		
10				
12				
14				8.68

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TABLE II(4)

INTERSTATE METALS SEPARATING DATA:
SOILS DATA FROM DEEP WELL CLUSTER (MW6, MW7, MW8)

SAMPLE ID	DEPTH feet	Cu mg/kg	Cu Cu/170	Pb mg/kg	Pb Pb/100	Hg mg/kg	Hg Hg/1	Zn mg/kg	Zn Zn/350	TOTAL mg/kg
MW6-2	2	14700.0	86.5	4900.0	49.0	55.3	55.3	110000.0	314.3	129655
MW6-2	2	14700.0	86.5	4900.0	49.0	55.3	55.3	110000.0	314.3	129655
MW6-4	4	7300.0	42.9	7800.0	78.0	0.3	0.3	22100.0	63.1	37200
MW6-6	6	1960.0	11.5	460.0	4.6	0.5	0.5	9650.0	27.6	12070
MW6-8	8	18.6	0.1	4.7	0.0	U	U	63.5	0.2	87
MW6-10	10	120.0	0.7	5.6	0.1	U	U	320.0	0.9	446
MW7-12	12	120.0	0.7	21.9	0.2	U	U	600.0	1.7	742
MW6-14	14	130.0	0.8	8.6	0.1	U	U	270.0	0.8	409
MW7-14	14	29.6	0.2	6.2	0.1	U	U	160.0	0.5	196
MW8-14	14	28.5	0.2	5.2	0.1	U	U	140.0	0.4	174
MW6-16	16	34.4	0.2	U	U	U	U	580.0	1.7	614
MW6-18	18	25.5	0.2	U	U	U	U	79.5	0.2	105
MW6-20	20	23.2	0.1	U	U	U	U	45.8	0.1	69
MW6-24	24	15.0	0.1	U	U	U	U	44.0	0.1	59
MW6-28	28	25.3	0.1	3.7	0.0	U	U	104.0	0.3	133
MW6-35	35	66.6	0.4	7.4	0.1	U	U	308.0	0.9	382
MW6-40C	37	130.0	0.8	14.0	0.1	U	U	490.0	1.4	634
MW6-40B	38	50.7	0.3	8.5	0.1	0.1	0.1	180.0	0.5	239
MW6-40A	39	210.0	1.2	22.1	0.2	U	U	710.0	2.0	942

INTERSTATE METALS SEPARATING CORP.:
GROUNDWATER LEVEL MEASUREMENTS IN FEET

WELL	TOP OF CASING ELEVATION	TOP OF CASING TO GROUND	GROUND ELEVATION
MW1	7.19	2.00	5.19
MW2	6.85	2.40	4.45
MW3	6.18	2.80	3.38
MW4	7.54	3.60	3.94
MW5	5.89	3.70	2.19
MW6	6.42	2.42	4.00
MW7	6.14	2.29	3.85
MW8	5.98	2.00	3.98

WELL	DATE	TIME	TOP OF CASING TO WATER	WATER ELEVATION
MW1	05-Feb-87	9:45	6.30	0.89
MW1	04-Mar-87	7:55	5.95	1.24
MW1	09-Mar-87	8:10	5.97	1.22
MW1	17-Mar-87	8:45	6.50	0.69
MW1	03-Aug-87	8:50	7.88	-0.68
MW1	21-Aug-87	8:51	8.31	-1.12
MW2	05-Feb-87	11:50	4.95	1.90
MW2	04-Mar-87	8:07	4.70	2.15
MW2	09-Mar-87	8:22	4.62	2.23
MW2	17-Mar-87	12:56	4.92	1.93
MW2	03-Aug-87	8:53	5.58	1.27
MW2	21-Aug-87	8:47	5.67	1.18
MW3	05-Feb-87	12:37	4.55	1.63
MW3	04-Mar-87	8:09	4.35	1.83
MW3	09-Mar-87	8:25	4.28	1.90
MW3	17-Mar-87	12:53	4.55	1.63
MW3	03-Aug-87	8:55	5.09	1.09
MW3	21-Aug-87	8:45	5.23	0.95
MW4	05-Feb-87	13:23	6.05	1.49
MW4	04-Mar-87	8:12	5.65	1.89
MW4	09-Mar-87	8:30	5.64	1.90
MW4	17-Mar-87	12:49	5.94	1.60
MW4	03-Aug-87	8:56	6.52	1.02
MW4	21-Aug-87	8:35	6.58	0.96
MW5	05-Feb-87	14:03	5.05	0.84
MW5	04-Mar-87	8:15	5.03	0.86
MW5	09-Mar-87	8:32	4.98	0.91
MW5	17-Mar-87	12:45	5.32	0.57
MW5	03-Aug-87	9:00	5.83	0.06
MW5	21-Aug-87	8:23	6.02	-0.13
MW6	09-Mar-87	8:36	5.86	0.56
MW6	17-Mar-87	8:50	6.33	0.09
MW6	03-Aug-87	9:04	7.25	-0.83
MW6	21-Aug-87	8:30	7.69	-1.27
MW7	09-Mar-87	8:39	5.10	1.04
MW7	17-Mar-87	8:50	5.55	0.59
MW7	03-Aug-87	9:06	6.38	-0.24
MW7	21-Aug-87	8:29	6.71	-0.57
MW8	09-Mar-87	8:40	4.75	1.23
MW8	17-Mar-87	8:51	5.20	0.78
MW8	03-Aug-87	9:15	5.87	0.11
MW8	21-Aug-87	8:25	6.27	-0.29

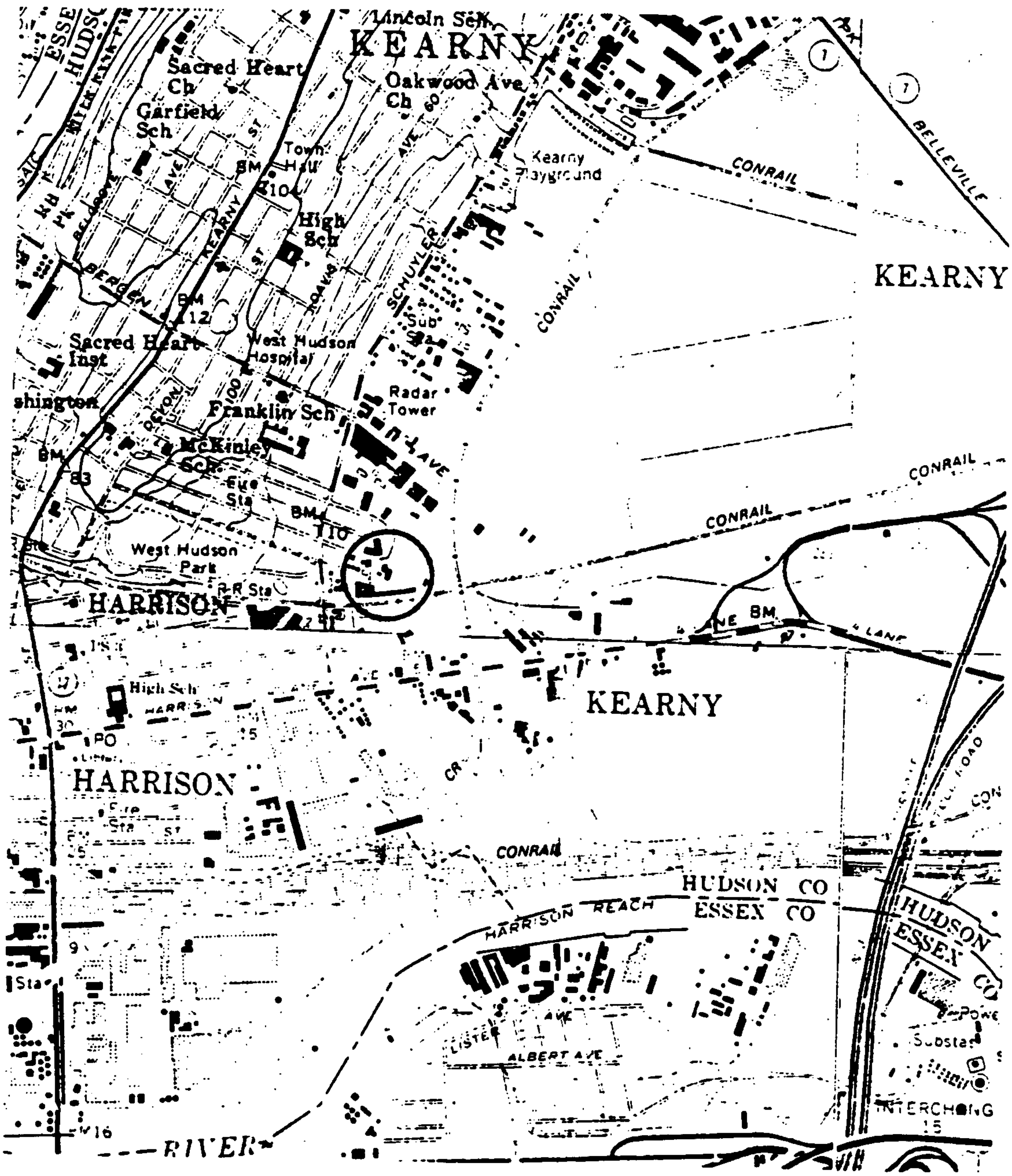
TABLE II(6)

INTERSTATE METALS SEPARATING CORP.:
SOIL VS. WATER CONCENTRATIONS

MAP SITE	SAMPLE ID	SAMPLE TYPE	pH su	CONDUCT. umhos/cm	Cu mg/kg	Pb mg/kg	Hg mg/kg	Zn mg/kg	TOTAL mg/kg
1	MW1	SOIL	7.72	174.3	277.6	1178.1	1.34	7656.4	9113
2	MW2	SOIL	8.95	703.6	12527.2	4789.4	6.57	45626.0	62949
3	MW3	SOIL	8.91	1378.3	15651.5	6226.5	27.23	102269.0	124174
4	MW4	SOIL	7.71	391.7	3564.0	974.9	2.53	9225.7	13767
5	MW5	SOIL	8.52	407.1	3172.8	1095.9	1.30	15071.3	19341
6	MW6	SOIL	8.90	592.0	96.5	11.1	0.03	358.4	466
7	MW7	SOIL	8.28	565.0	24.5	0.0	0.00	187.3	212
8	MW8	SOIL	8.45	516.7	3468.8	1885.6	8.01	20417.6	25780
U	LS-1	SOIL	9.63	2000.0	45000.0	14000.0	190.00	290000.0	349190
V	LS-2	SOIL	9.89	1500.0	92000.0	11000.0	56.20	300000.0	403056
W	LS-3	SOIL	9.48	1510.0	38000.0	5200.0	61.30	270000.0	313261
X	PS-1	SOIL	8.68	900.0	1800.0	6000.0	780.00	68000.0	76580
Y	PS-2	SOIL	9.43	450.0	30000.0	11000.0	11.40	21000.0	62011
Z	PS-3	SOIL	8.69	590.0	20000.0	6700.0	41.60	62000.0	88742
					mg/l	mg/l	mg/l	mg/l	mg/l
1	MW1	WATER	7.45	630	0.000	0.290	0.0000	0.270	0.560
2	MW2	WATER	8.41	1280	0.050	0.062	0.0000	0.820	0.932
3	MW3	WATER	9.87	1800	0.510	0.055	0.0000	0.150	0.715
4	MW4	WATER	7.63	1750	0.070	0.042	0.0000	2.100	2.212
5	MW5	WATER	8.04	2200	0.110	0.042	0.0000	0.280	0.432
6	MW6	WATER	8.29	2500	0.000	0.016	0.0000	0.320	0.336
7	MW7	WATER	8.18	2400	0.080	0.041	0.0000	0.750	0.871
8	MW8	WATER	8.27	2500	0.080	0.017	0.0000	0.320	0.417
U	LW-1	WATER	10.02	3500	0.300	0.237	0.0000	0.070	0.607
V	LW-2	WATER	10.08	3600	0.410	0.304	0.0000	0.070	0.784
W	LW-3	WATER	10.07	3500	0.260	0.141	0.0000	0.010	0.411
X	PW-1	WATER	8.48	790	0.130	0.136	0.0035	0.480	0.750
Y	PW-2	WATER	8.69	400	0.070	0.027	0.0012	0.170	0.268
Z	PW-3	WATER	8.68	400	0.430	0.044	0.0012	0.070	0.545

INTERSTATE METALS

FIGURE I.(1)



J.H. CROW CO., INC.

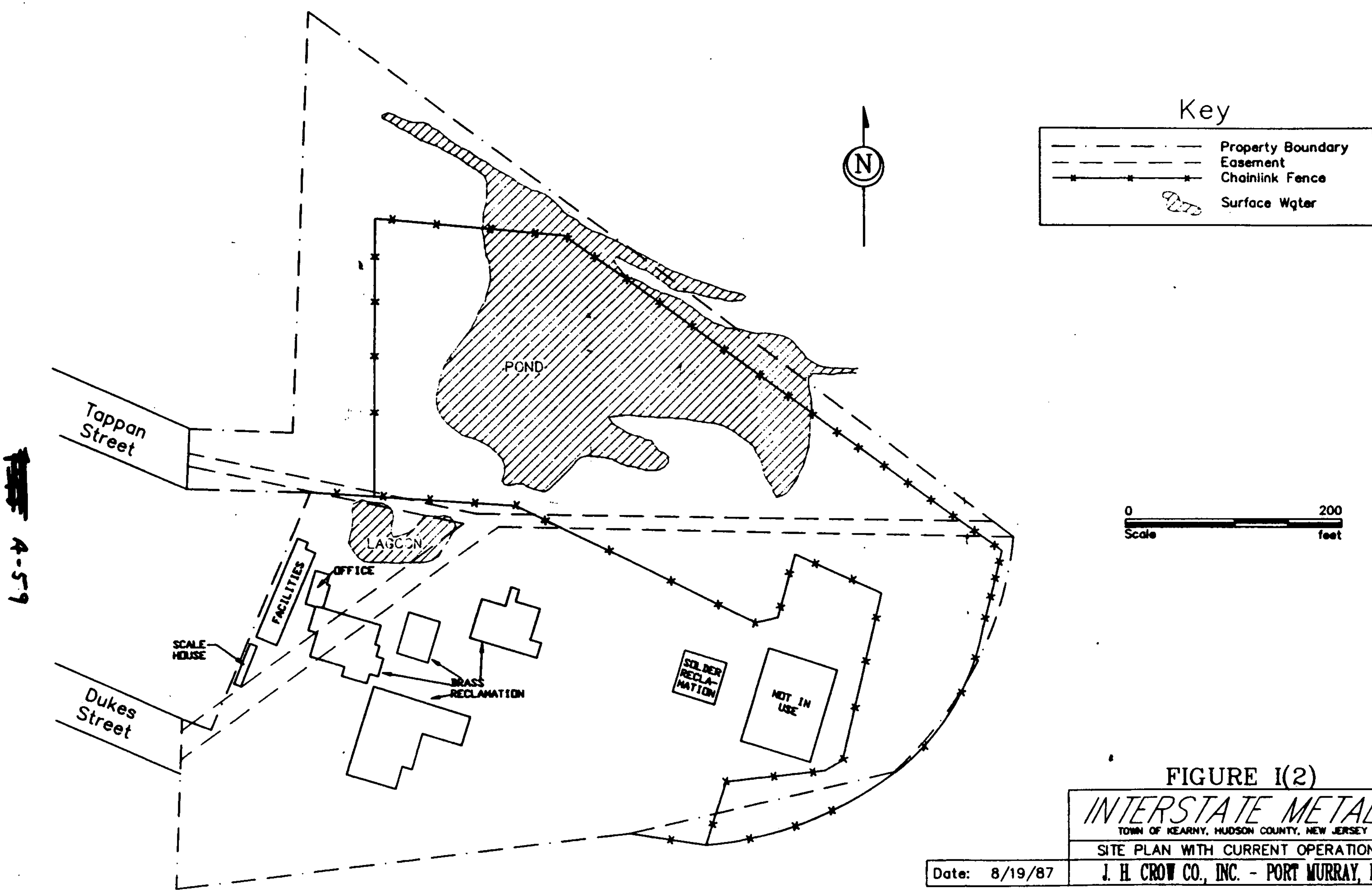


FIGURE I(2)

INTERSTATE METALS
TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY

SITE PLAN WITH CURRENT OPERATIONS

Date: 8/19/87

J. H. CROW CO., INC. - PORT MURRAY, NJ

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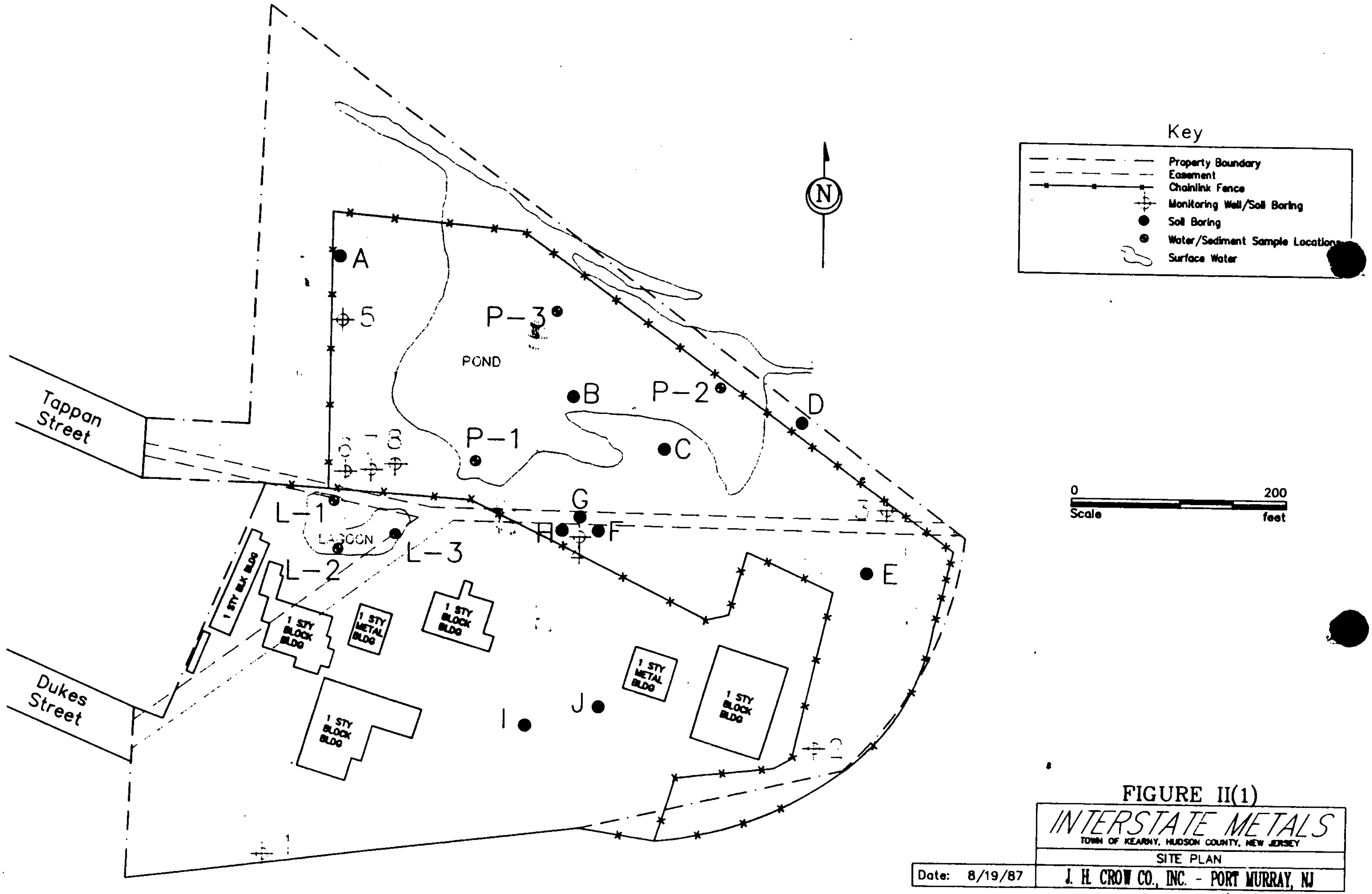

FIGURE II(1)

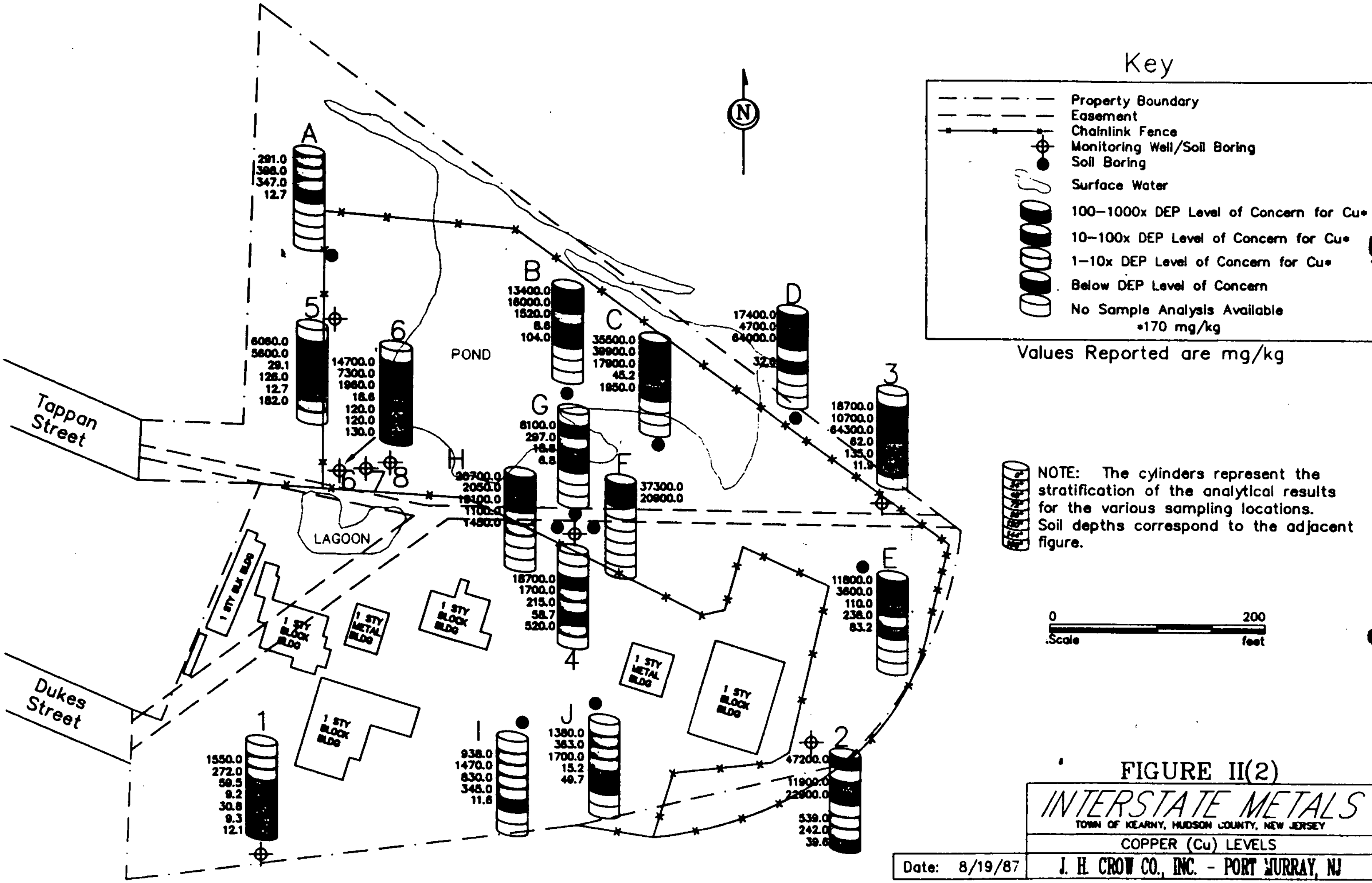

FIGURE II(2)

INTERSTATE METALS
TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY
COPPER (Cu) LEVELS
Date: 8/19/87
J. H. CROW CO., INC. - PORT MURRAY, NJ

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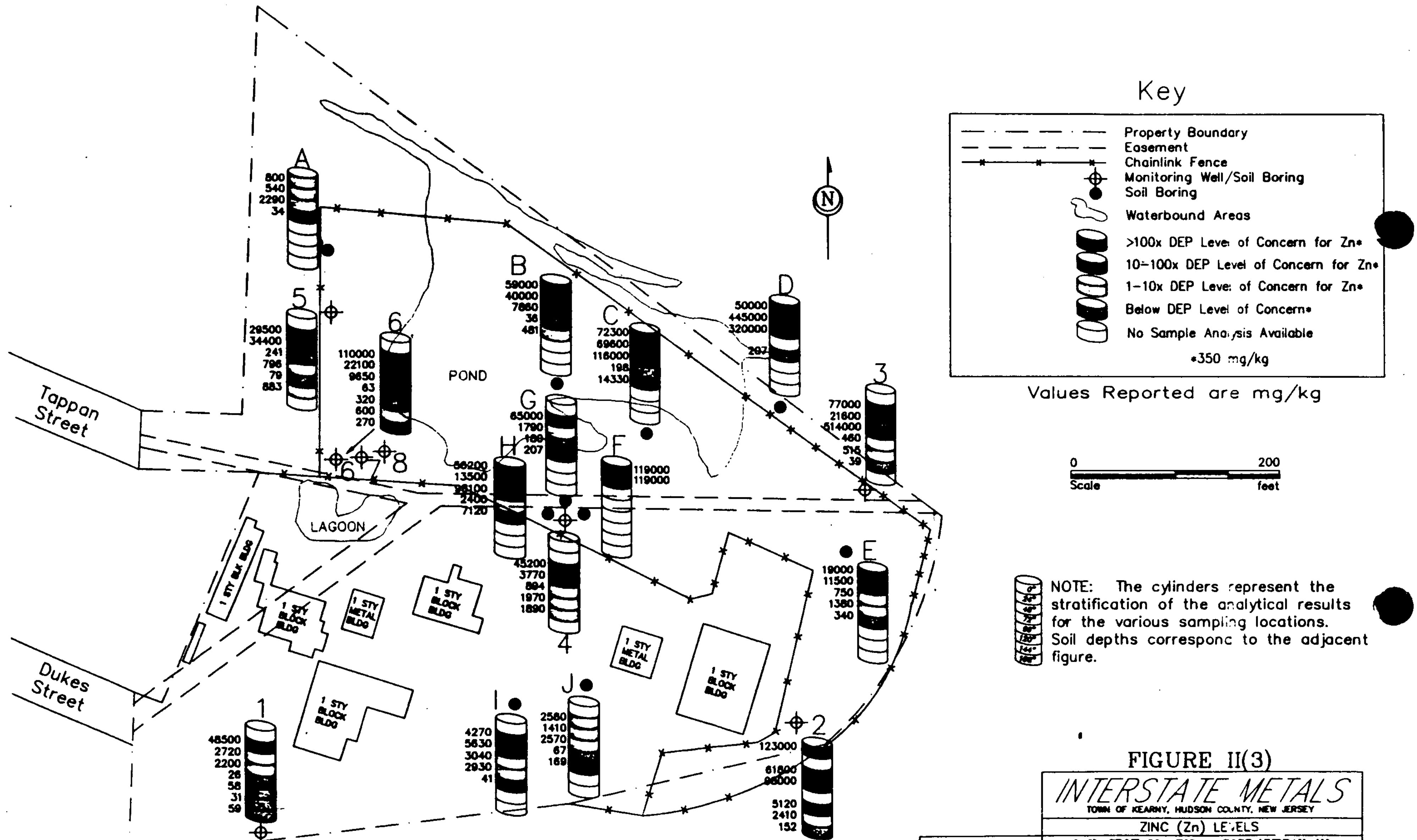

FIGURE II(3)

INTERSTATE METALS

TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY

ZINC (Zn) LEVELS

Date: 8/19/87 | J. H. CROW CO., INC. - PORT MURRAY, NJ

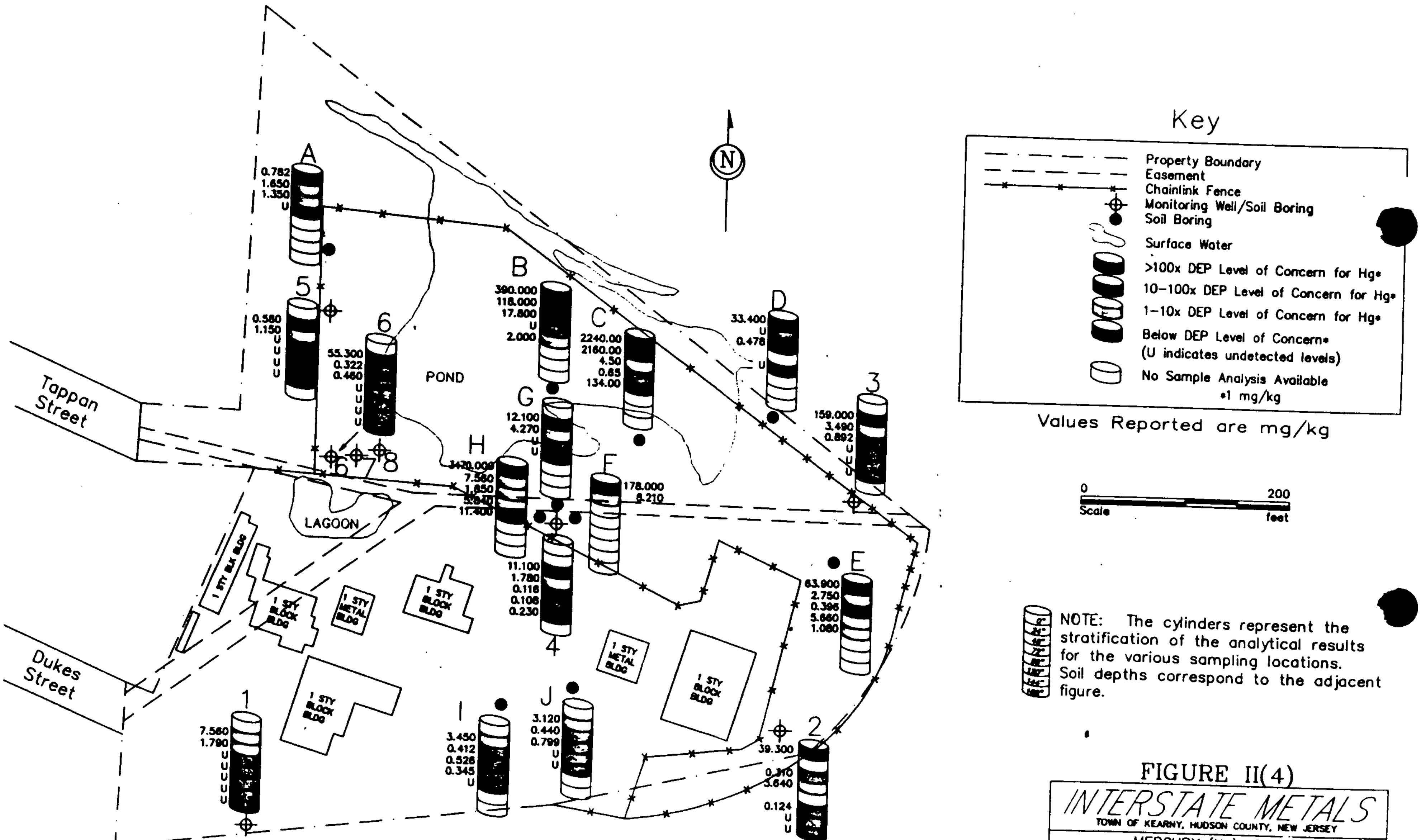

FIGURE II(4)

INTERSTATE METALS

TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY

MERCURY (Hg) LEVELS

Date: 8/18/87

J. H. CROW CO., INC. - PORT MURRAY, NJ

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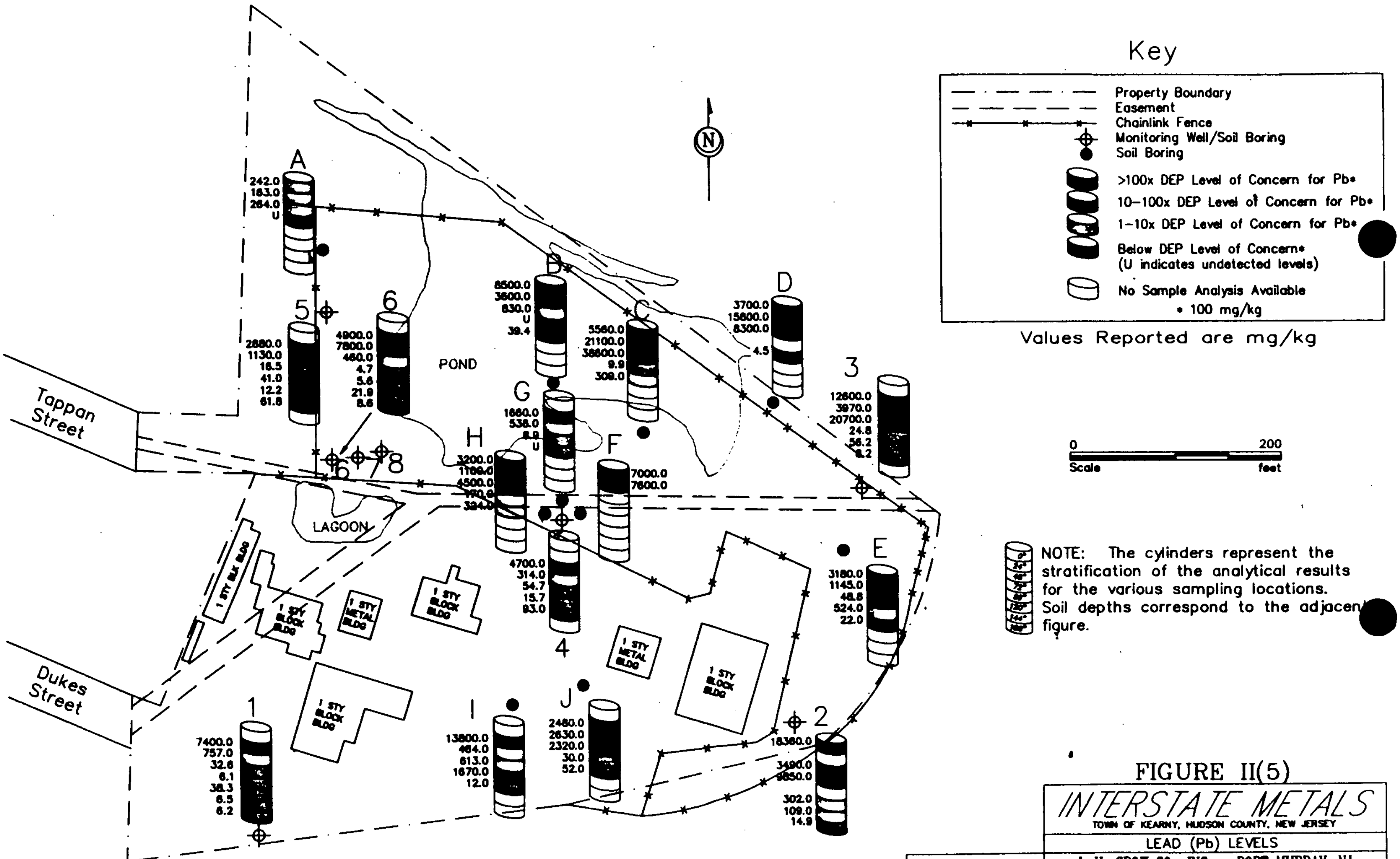

FIGURE II(5)

INTERSTATE METALS
TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY
LEAD (Pb) LEVELS

Date: 8/19/87 | J. H. CROW CO., INC. - PORT MURRAY, NJ

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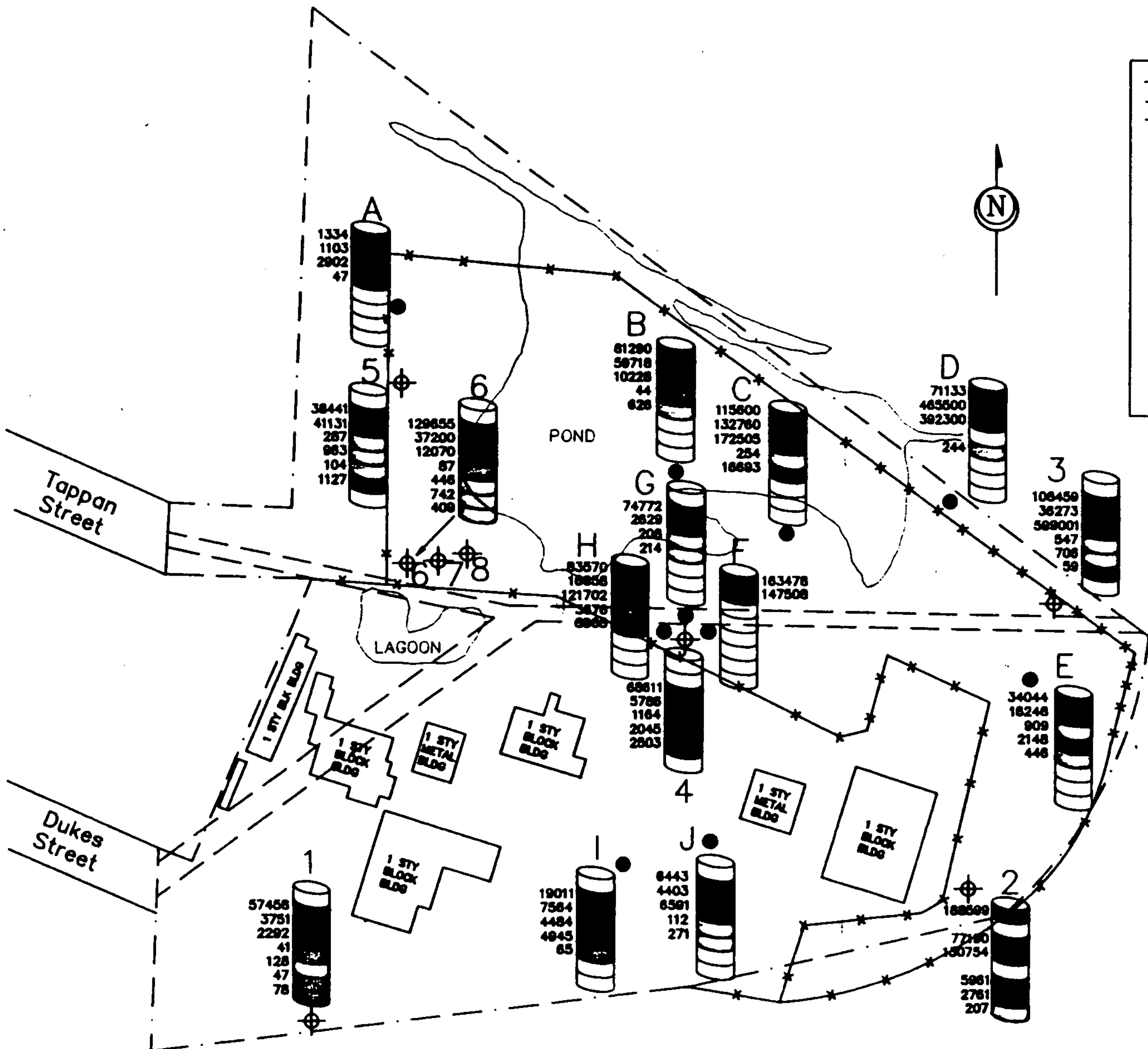


Key

- Property Boundary
- Easement
- Chainlink Fence
- Monitoring Well/Soil Boring
- Soil Boring
- Surface Water
- 100–600 g/kg Total Concentration*
- 10–100 g/kg Total Concentration*
- 1–10 g/kg Total Concentration*
- 100–1000 mg/kg Total Concentration*
- <100 mg/kg Total Concentration*
- No Sample Analysis Available

* Copper+Zinc+Mercury+Lead Levels

Values Reported are mg/kg

0 Scale 200 feet

NOTE: The cylinders represent the stratification of the analytical results for the various sampling locations. Soil depths correspond to the adjacent figure.

FIGURE II(6)

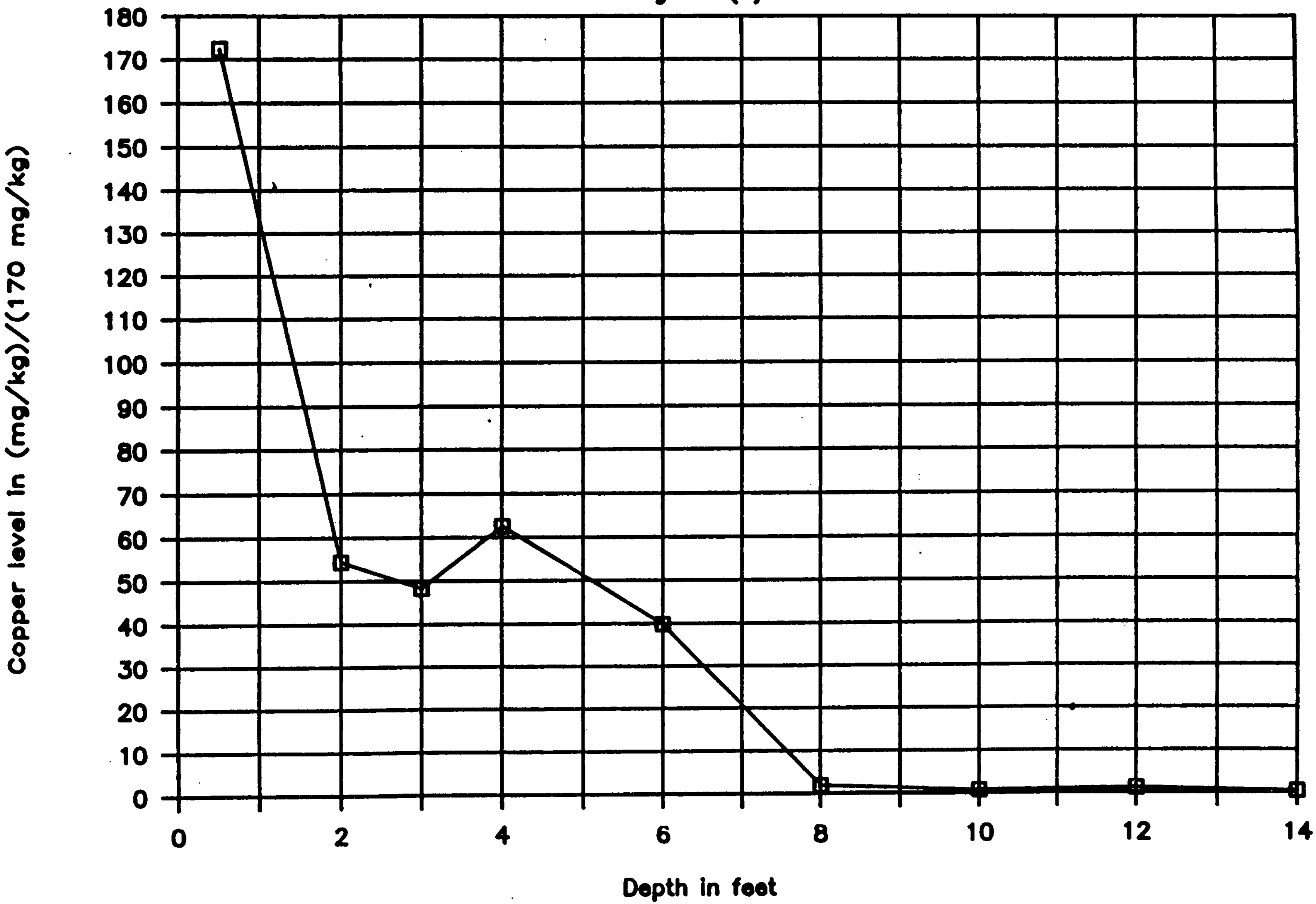
INTERSTATE METALS
TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY

TOTAL CONCENTRATION OF Cu Zn, Hg, Pb

Date: 8/19/87 | J. H. CROW CO., INC. - PORT MURRAY, NJ

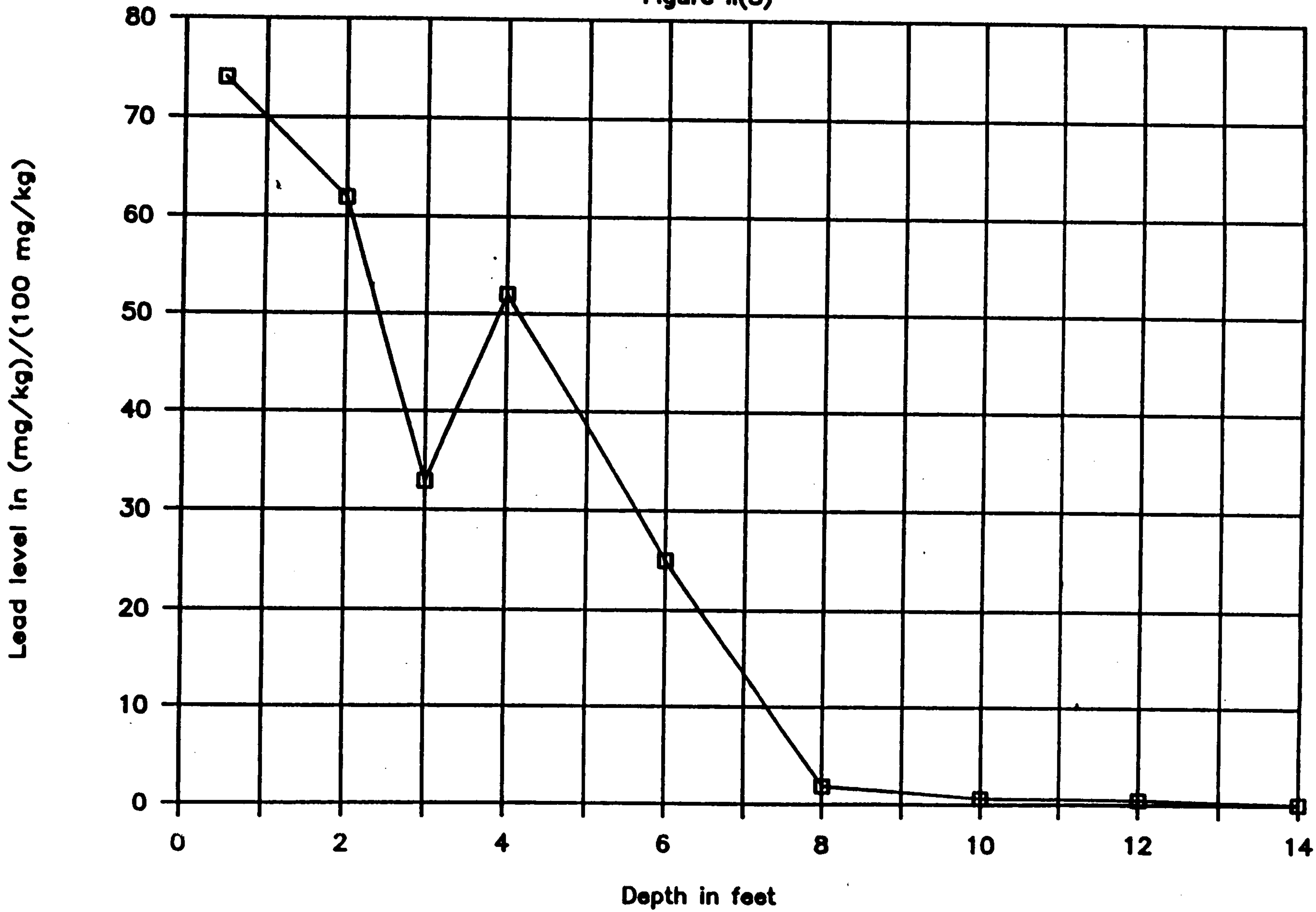
MEAN COPPER LEVELS IN SOILS

Figure II(7)



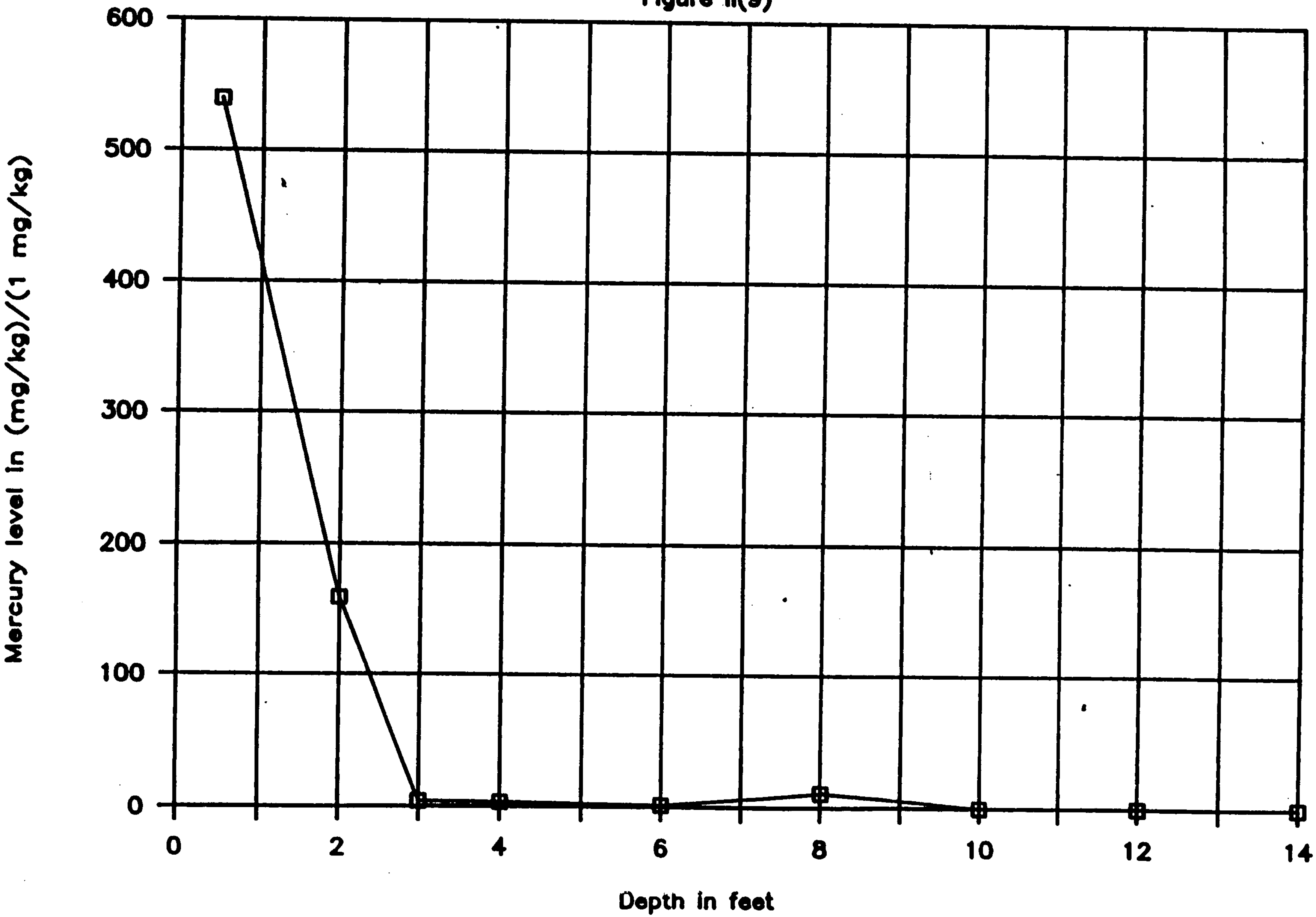
MEAN LEAD LEVELS IN SOILS

Figure II(8)



MEAN MERCURY LEVELS IN SOILS

Figure II(9)



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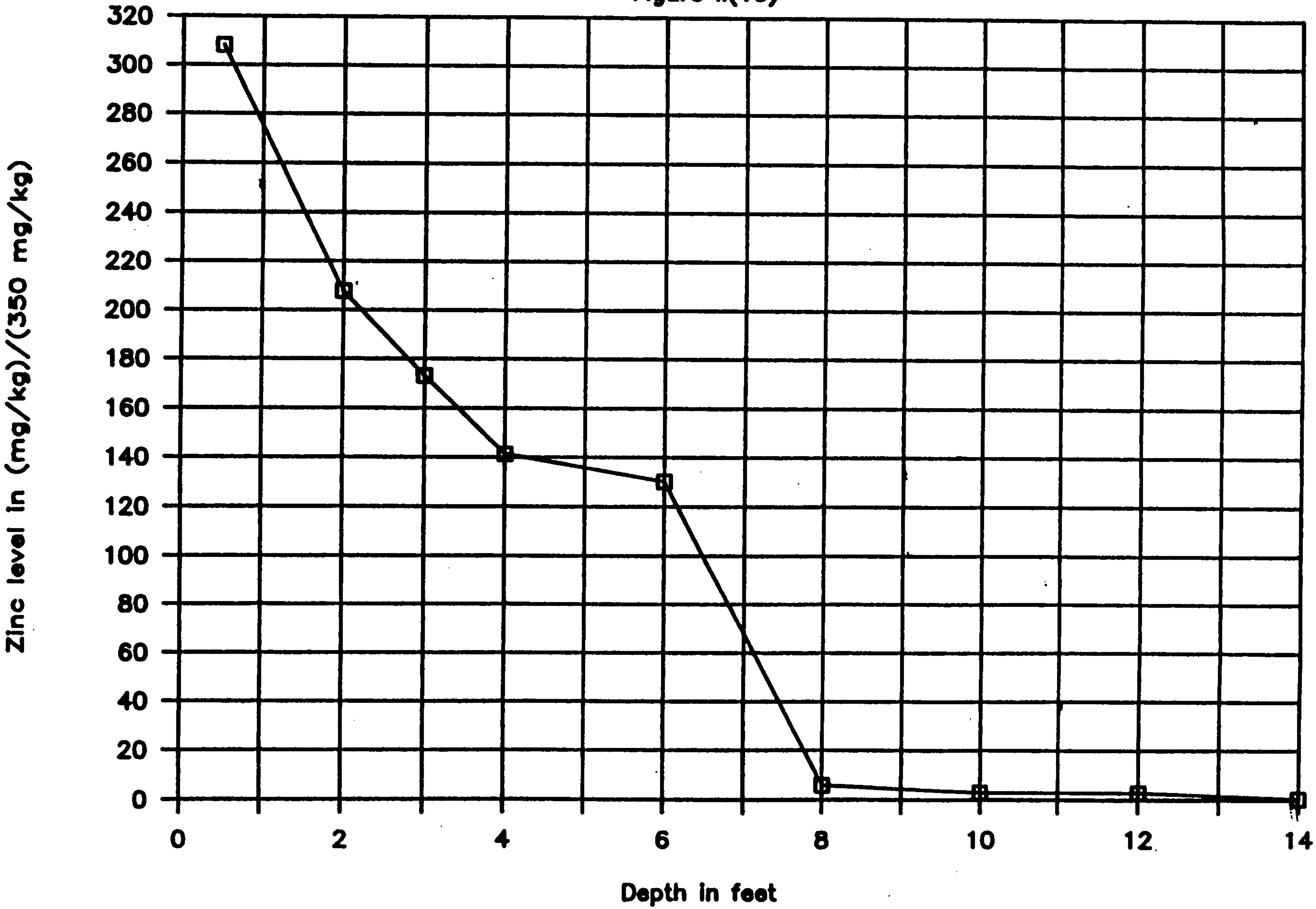
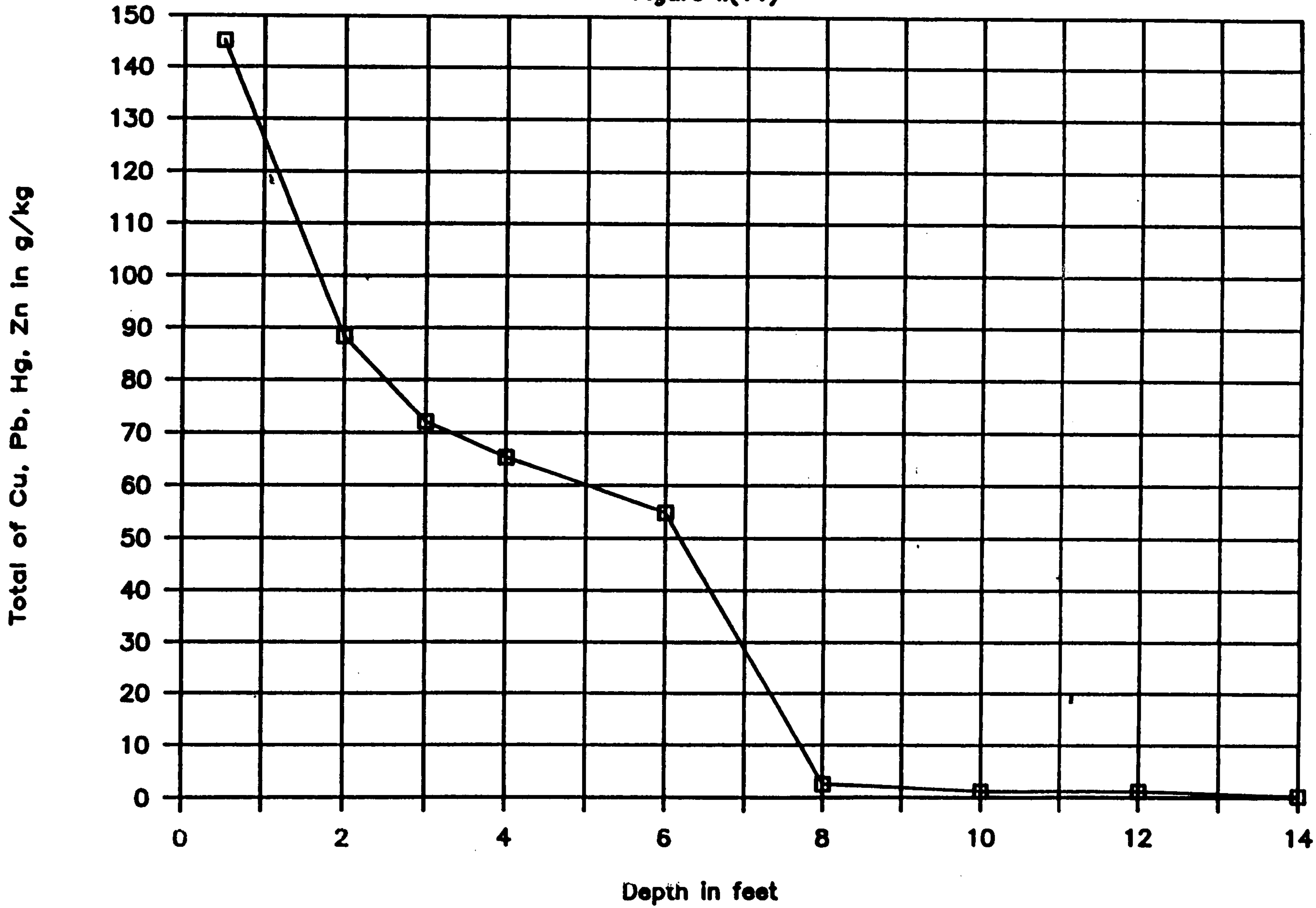
MEAN ZINC LEVELS IN SOILS

Figure II(10)



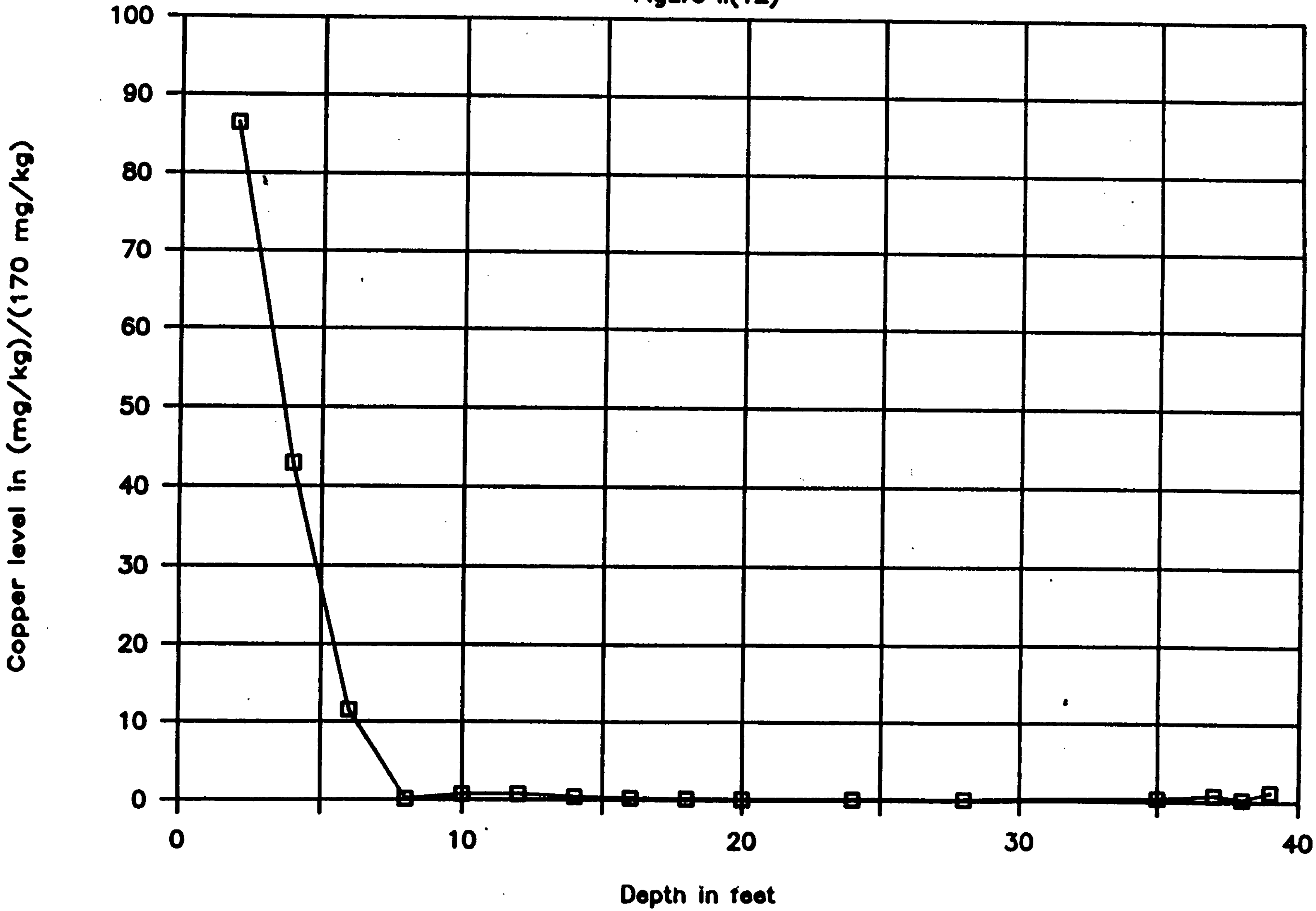
MEAN TOTAL OF CU, PB, HG, ZN IN SOILS

Figure II(11)



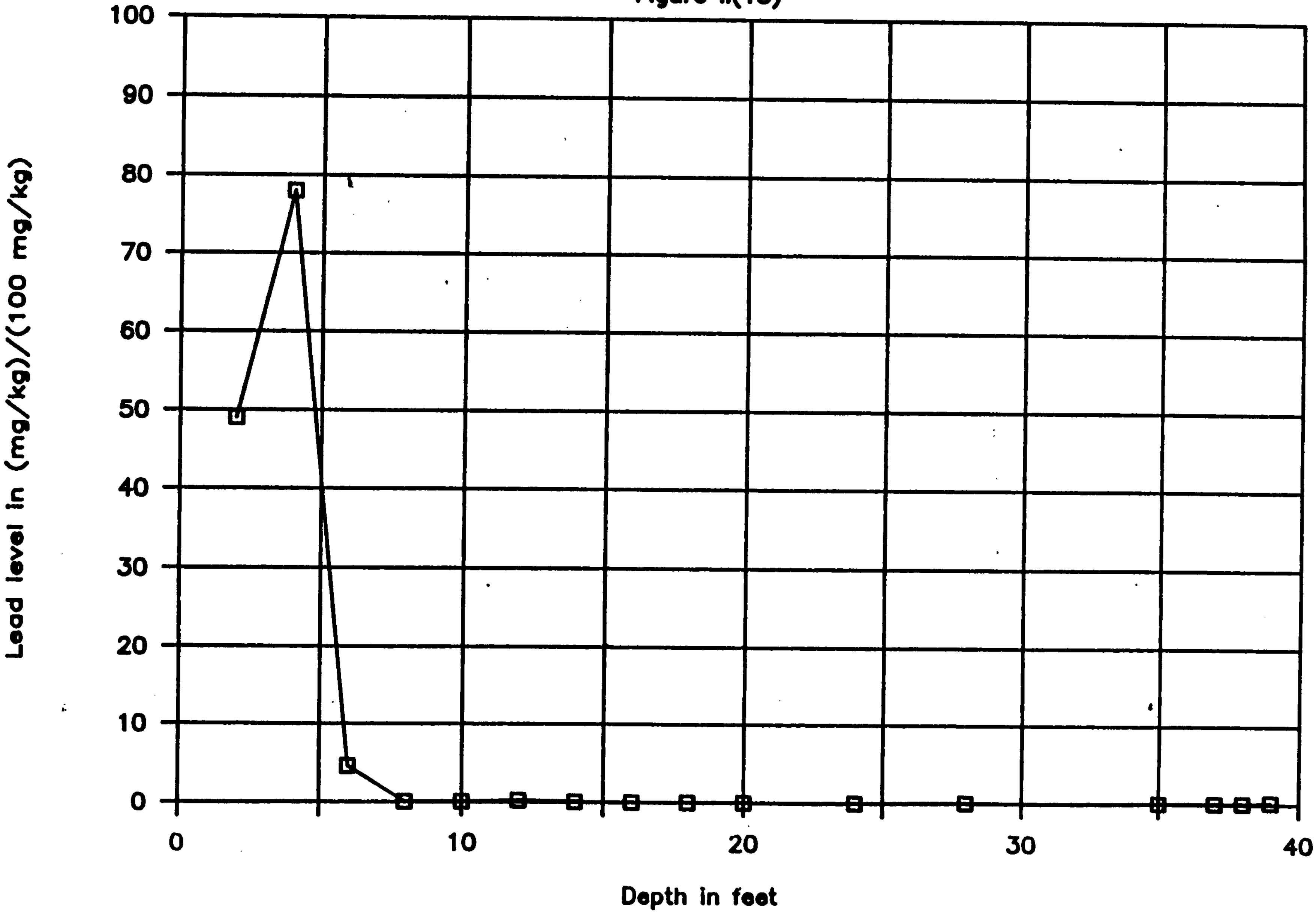
COPPER LEVELS IN DEEP WELL

Figure II(12)



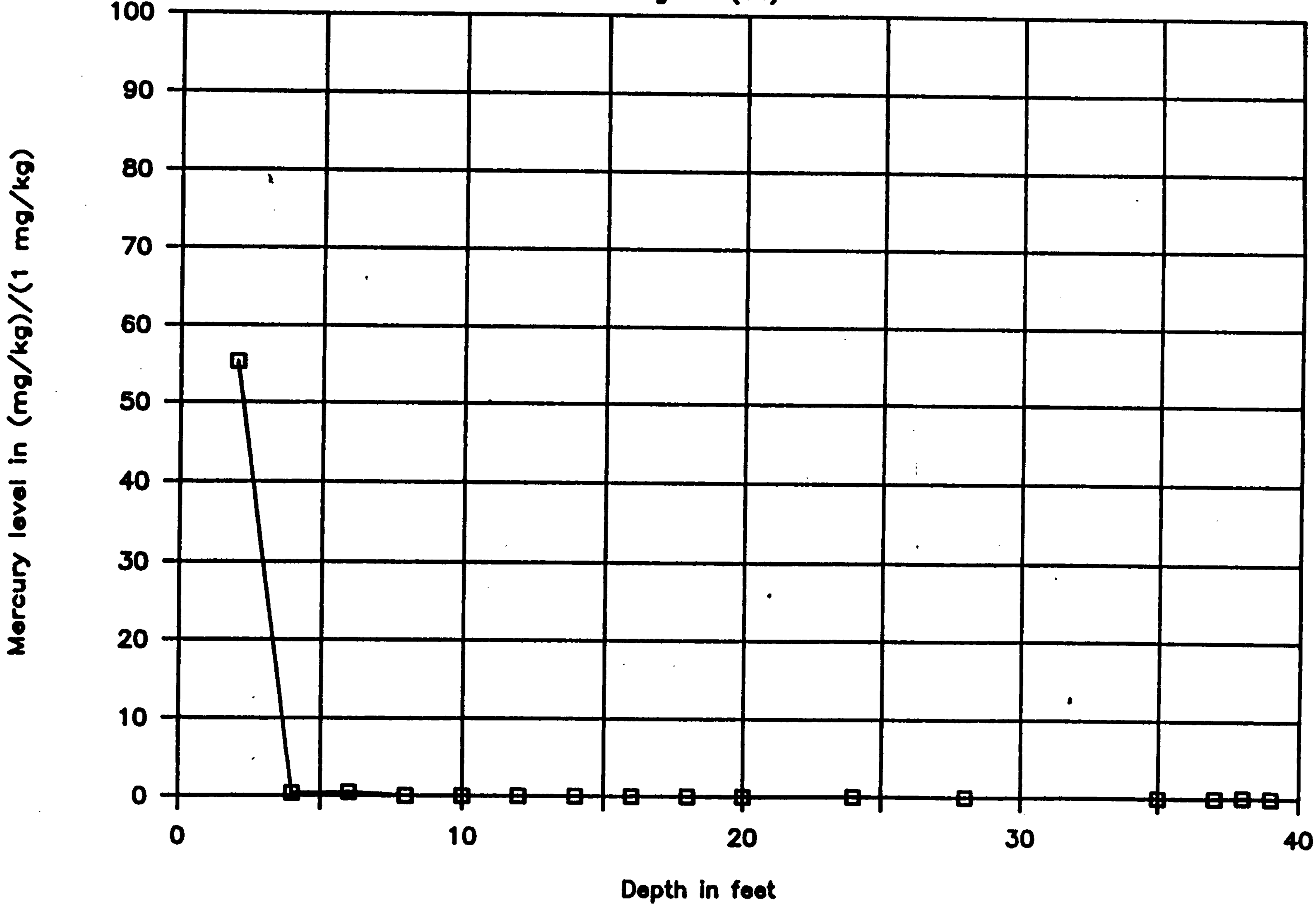
LEAD LEVELS IN DEEP WELL

Figure II(13)



MERCURY LEVELS IN DEEP WELL

Figure II(14)



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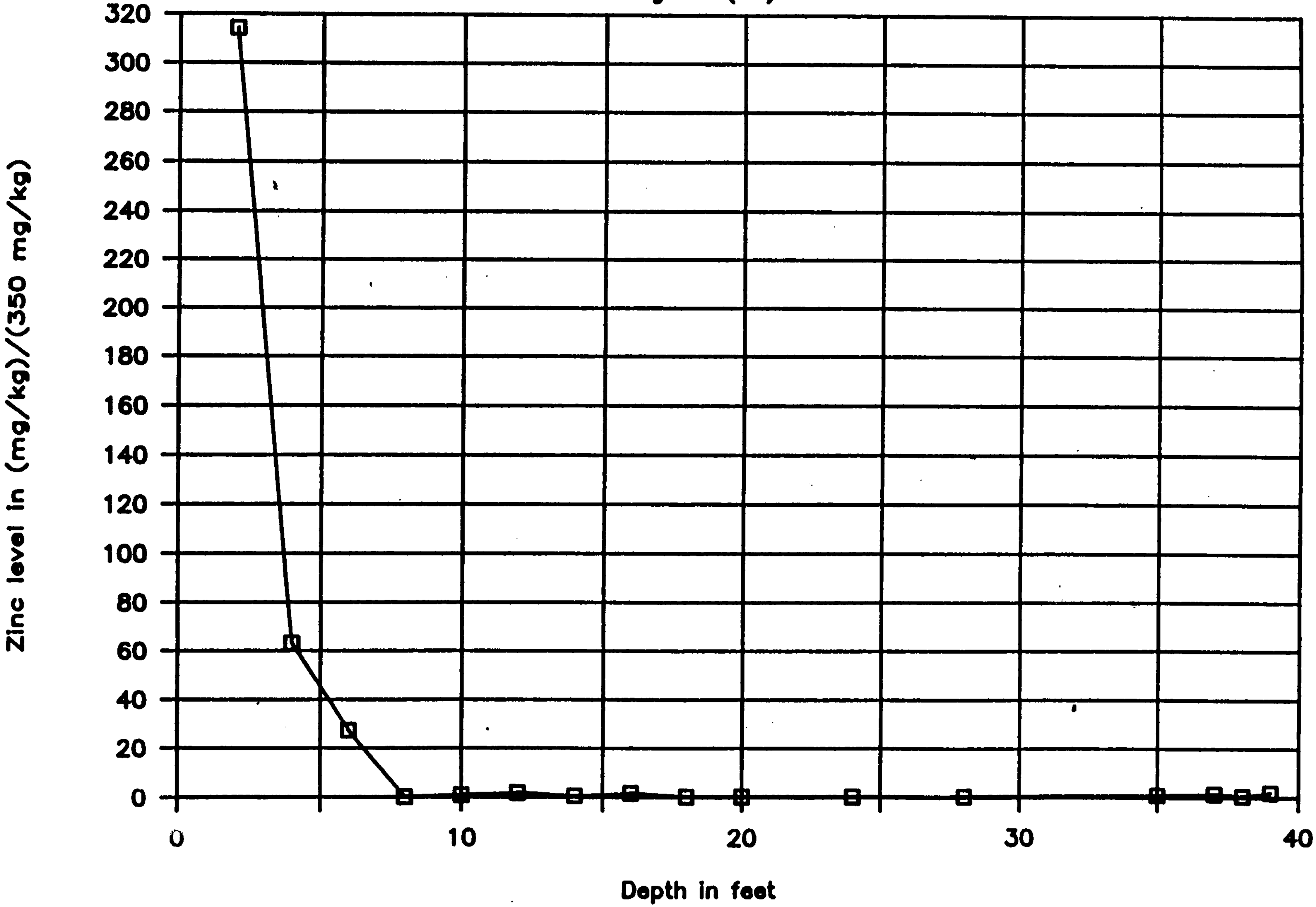
ZINC LEVELS IN DEEP WELL

Figure II(15)



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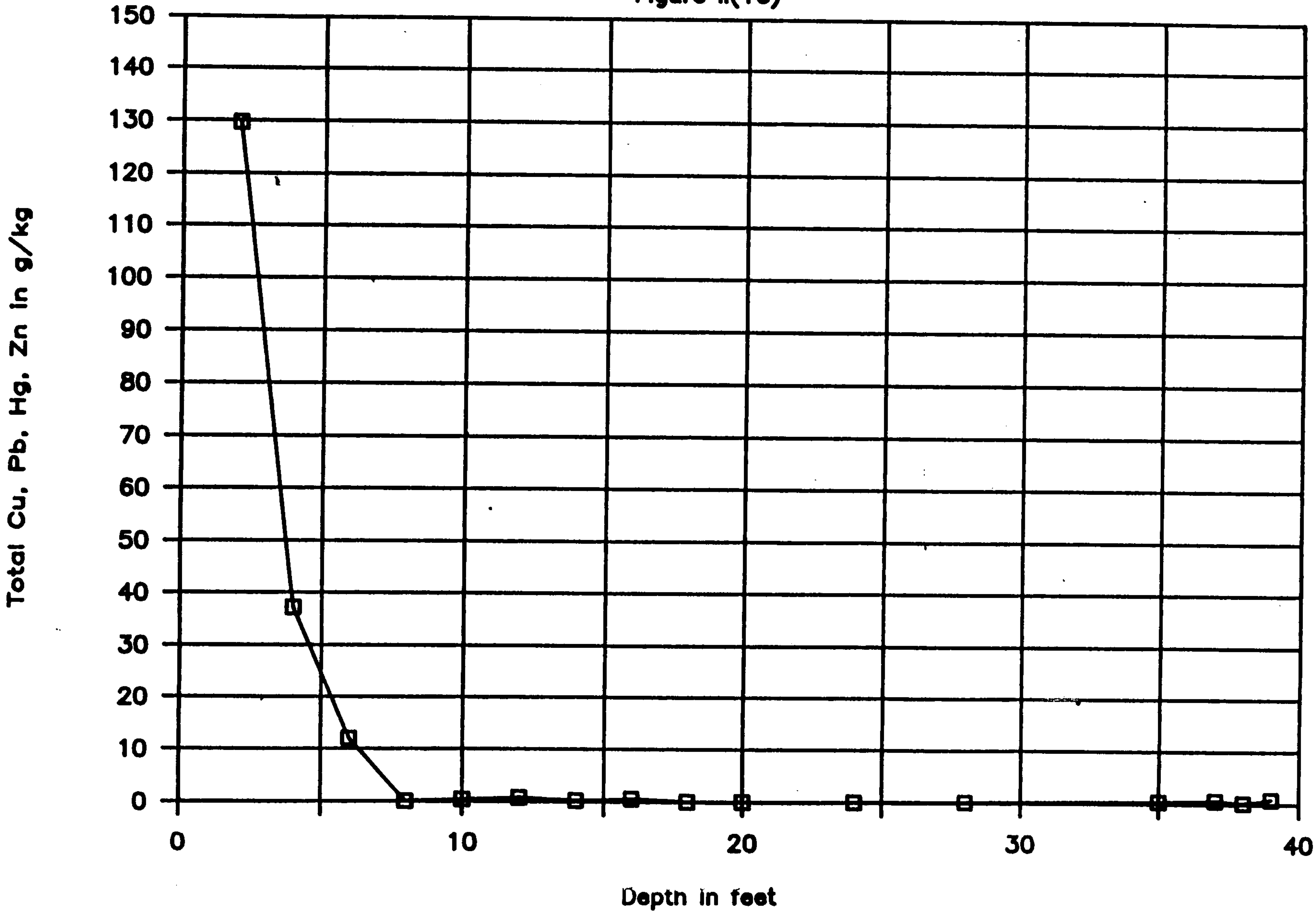
TOTAL CU, PB, HG, ZN IN DEEP WELL

Figure II(16)



4-75

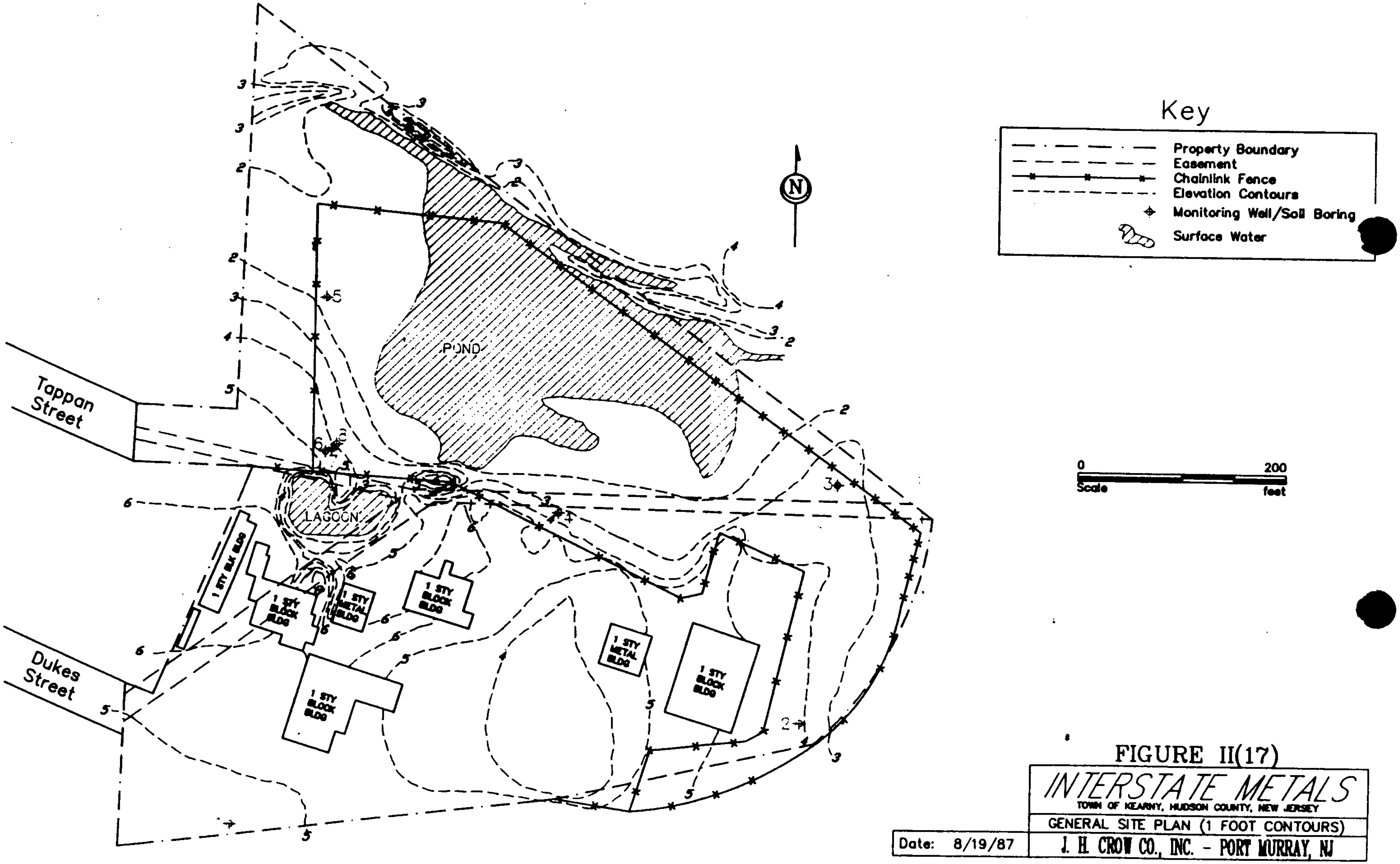


FIGURE II(17)

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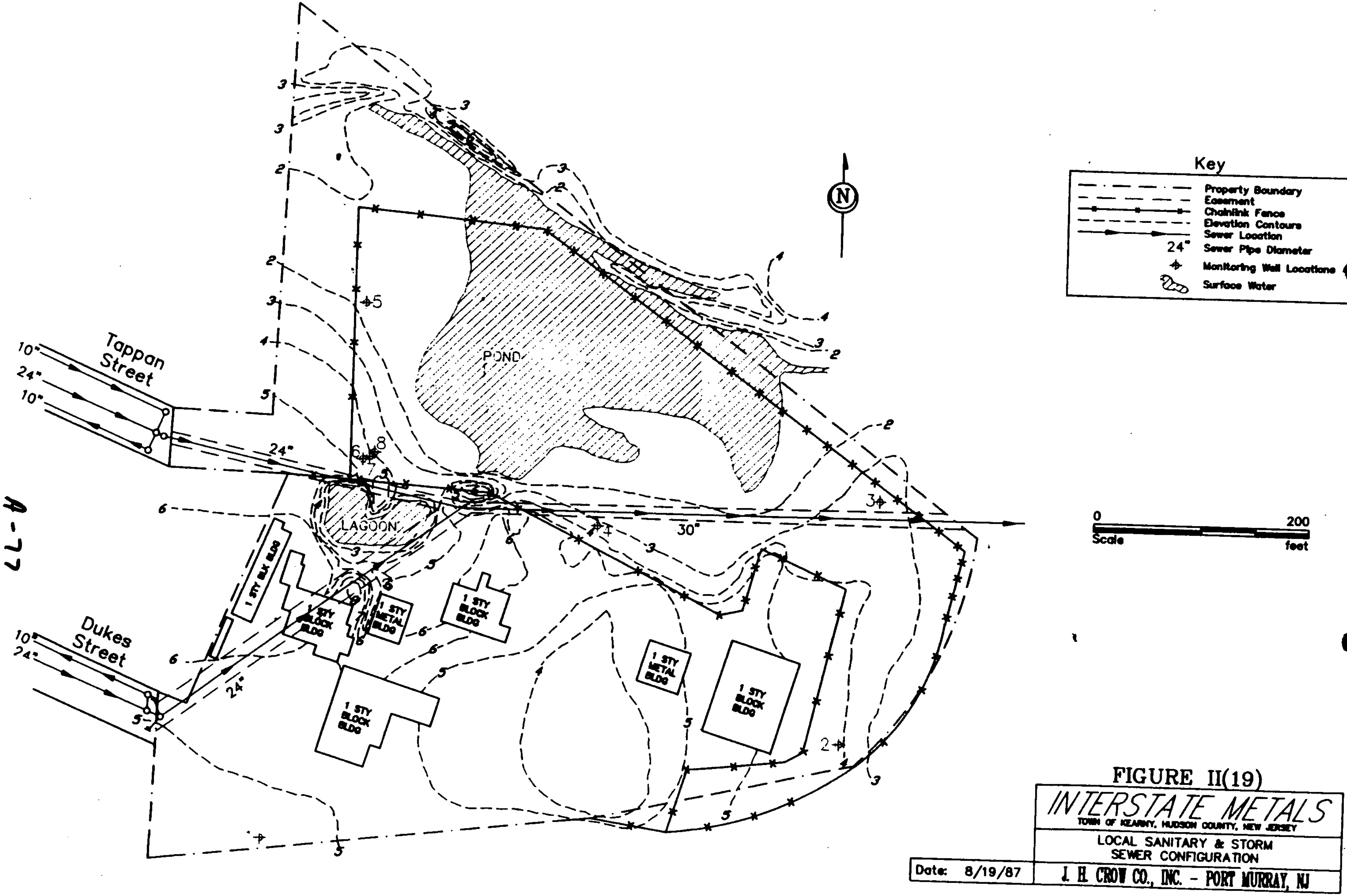
Key
Property Boundary
Easement
Chainlink Fence
Elevation Contours
Sewer Location
24" Sewer Pipe Diameter
Monitoring Well Locations
Surface Water
Tappan Street
Dukes Street
POND
LAGOON
1 STY BLK BLDG
1 STY BLOCK BLDG
1 STY METAL BLDG
24"
30"
10"
0
200
Scale
feet
INTERSTATE METALS
TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY
LOCAL SANITARY & STORM SEWER CONFIGURATION
Date: 8/19/87
J. H. CROW CO., INC. - PORT MURRAY, NJ

FIGURE II(19)

INTERSTATE METALS SEPARATING CORP.

Working Document for

Environmental Report -- Addendum A

March 15, 1988

J. H. CROW COMPANY, INC.

365B HOFFMAN ROAD
PORT MURRAY, NEW JERSEY 07865
(201) 689-0332

ATTACHMENT B-1

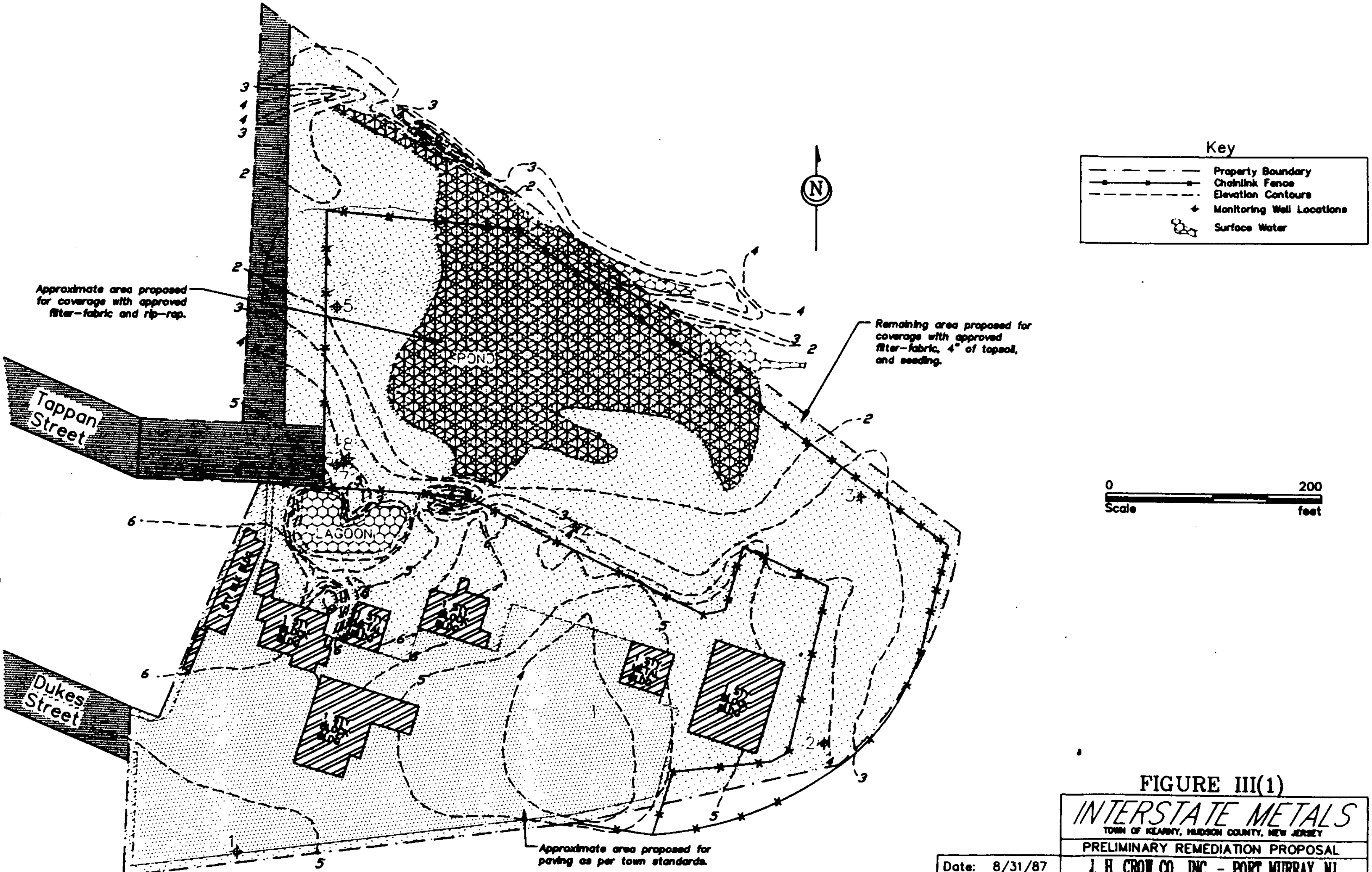

FIGURE III(1)

INTERSTATE METALS

TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY

PRELIMINARY REMEDIATION PROPOSAL

Date: 8/31/87

J. H. CROW CO., INC. - PORT MURRAY, NJ

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INTERSTATE METALS SEPARATING CORP.

Working Document for

Environmental Report -- Addendum A

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INTERSTATE METALS SEPARATING CORP.

Environmental Report -- Addendum A

I. MIGRATION OF METALS IN THE SUBSURFACE

A. FINDINGS

1. Surface Water

There are three perennial bodies of surface water on the Interstate site, the pond, the lagoon, and a small pond beside and in back of the building which is labeled "NOT IN USE" in Figure I(2). (This pond was not included on the topographic map of the site prepared for us by the surveyors.) The area of this small pond was excavated during the years of the copper recovery operation (1969 to 1976). This operation is described in our report of September 2, 1987, on page 5. During and after storms, water would collect in the area where trucks would move materials in and out of the building. To keep the trucks from becoming mired in mud, Interstate pumped water from the roadway to this excavated area. Since that time this small pond, which has no inlet or outlet, has collected stormwater runoff. It is continually wet because it is cut into the water table.

Visual observation of the small pond, the big pond, and the lagoon simultaneously gave the impression that the surface of each body of water has a slightly different elevation.

2. Ground Water Levels

On December 28, 1987 the water levels in the monitoring wells were measured again. These readings and those from all previous readings are reported in Table A-1.

3. Water Supply Well

The water supply well on the Interstate site was drilled in the mid-forties. It is said to be 603 feet deep. The position of the screening is unknown. The present pump runs at 200 gallons per minute. In recent years water has been pumped from the well for only two uses, to prime the pump that circulates the brass reclamation process water from the lagoon through the process and back to the lagoon, and to make up circulating water losses due to evaporation. In order to prime the circulating pump the water

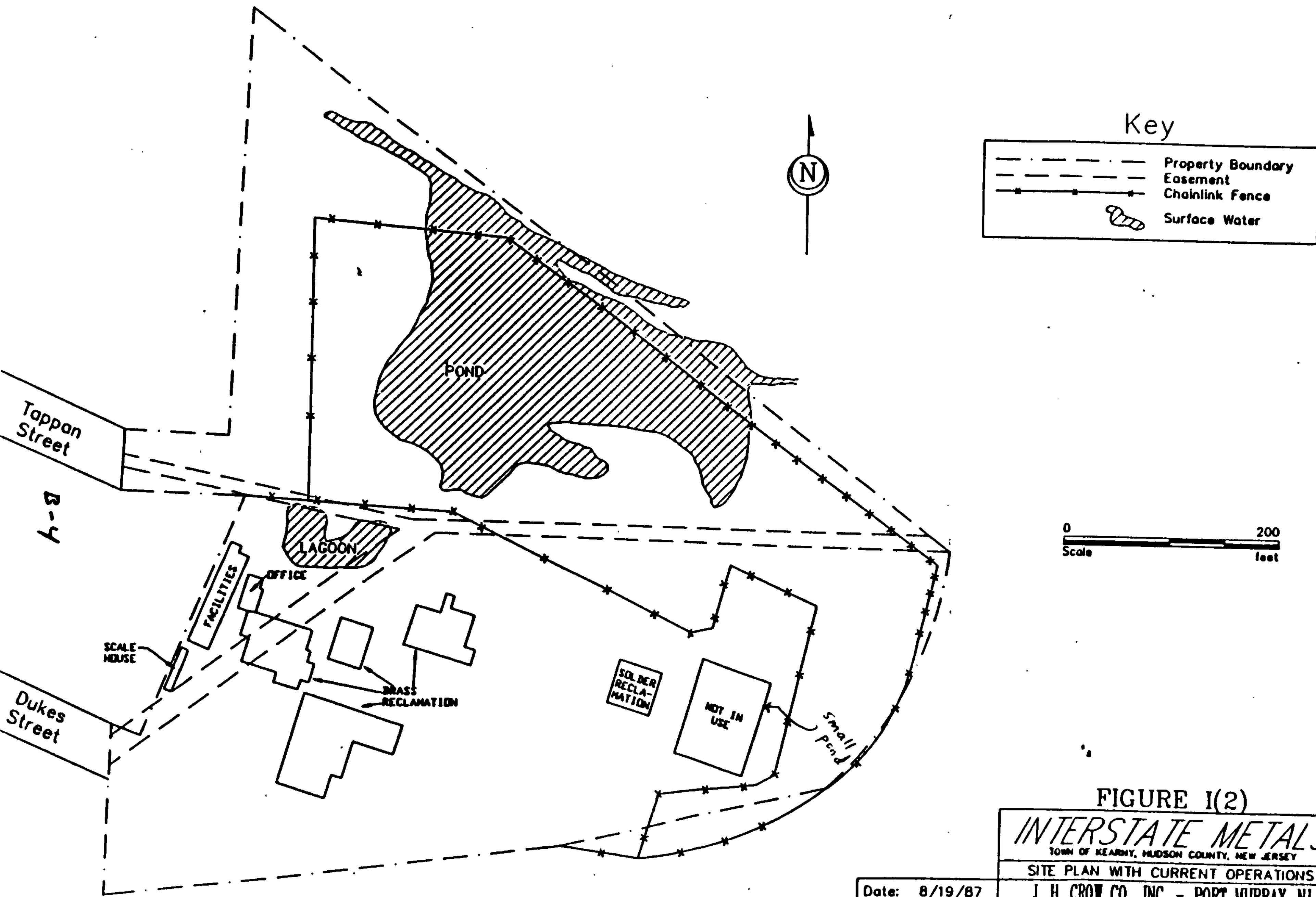

FIGURE I(2)

INTERSTATE METALS
TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY
SITE PLAN WITH CURRENT OPERATIONS
Date: 8/19/87
J. H. CROW CO., INC. - PORT MURRAY, NJ

GROUNDWATER LEVEL MEASUREMENTS IN FEET

WELL	TOP OF CASING ELEVATION	TOP OF CASING TO GROUND	GROUND ELEVATION
MW1	7.19	2.00	9.19
MW2	6.85	2.40	4.45
MW3	6.18	2.80	3.38
MW4	7.54	3.60	3.94
MW5	5.89	3.70	2.19
MW6	6.42	2.42	4.00
MW7	6.14	2.29	3.85
MW8	5.98	2.00	3.98

WELL	DATE	TIME	TOP OF CASING TO WATER	WATER ELEVATION
MW1	05-Feb-87	9:45	6.30	0.89
MW2	05-Feb-87	11:50	4.95	1.90
MW3	05-Feb-87	12:37	4.55	1.63
MW4	05-Feb-87	13:23	6.05	1.49
MW5	05-Feb-87	14:03	5.05	0.84
MW1	04-Mar-87	7:55	5.95	1.24
MW2	04-Mar-87	8:07	4.70	2.15
MW3	04-Mar-87	8:09	4.35	1.83
MW4	04-Mar-87	8:12	5:65	1.89
MW5	04-Mar-87	8:15	5.03	0.86
MW1	09-Mar-87	8:10	5.97	1.22
MW2	09-Mar-87	8:22	4.62	2.23
MW3	09-Mar-87	8:25	4.28	1.90
MW4	09-Mar-87	8:30	5.64	1.90
MW5	09-Mar-87	8:32	4.98	0.91
MW6	09-Mar-87	8:36	5.86	0.56
MW7	09-Mar-87	8:39	5.10	1.04
MW8	09-Mar-87	8:40	4.75	1.23

GROUNDWATER LEVEL MEASUREMENTS IN FEET

WELL	TOP OF CASING ELEVATION	TOP OF CASING TO GROUND	GROUND ELEVATION
MW1	7.19	2.00	5.19
MW2	6.85	2.40	4.45
MW3	6.18	2.80	3.38
MW4	7.54	3.60	3.94
MW5	5.89	3.70	2.19
MW6	6.42	2.42	4.00
MW7	6.14	2.29	3.85
MW8	5.98	2.00	3.98

WELL	DATE	TIME	TOP OF CASING TO WATER	WATER ELEVATION
MW1	17-Mar-87	8:45	6.50	0.69
MW2	17-Mar-87	12:56	4.92	1.93
MW3	17-Mar-87	12:53	4.55	1.63
MW4	17-Mar-87	12:49	5.94	1.60
MW5	17-Mar-87	12:45	5.32	0.57
MW6	17-Mar-87	8:50	6.33	0.09
MW7	17-Mar-87	8:50	5.55	0.59
MW8	17-Mar-87	8:51	5.20	0.78
MW1	03-Aug-87	8:50	7.88	-0.68
MW2	03-Aug-87	8:53	5.58	1.27
MW3	03-Aug-87	8:55	5.09	1.09
MW4	03-Aug-87	8:56	6.52	1.02
MW5	03-Aug-87	9:00	5.83	0.06
MW6	03-Aug-87	9:04	7.25	-0.83
MW7	03-Aug-87	9:06	6.38	-0.24
MW8	03-Aug-87	9:15	5.87	0.11

8-6

GROUNDWATER LEVEL MEASUREMENTS IN FEET

WELL	TOP OF CASING ELEVATION	TOP OF CASING TO GROUND	GROUND ELEVATION
MW1	7.19	2.00	5.19
MW2	6.85	2.40	4.45
MW3	6.18	2.80	3.38
MW4	7.54	3.60	3.94
MW5	5.89	3.70	2.19
MW6	6.42	2.42	4.00
MW7	6.14	2.29	3.85
MW8	5.98	2.00	3.98

WELL	DATE	TIME	TOP OF CASING TO WATER	WATER ELEVATION
MW1	21-Aug-87	8:51	8.31	-1.12
MW2	21-Aug-87	8:47	5.67	1.18
MW3	21-Aug-87	8:45	5.23	0.95
MW4	21-Aug-87	8:35	6.58	0.96
MW5	21-Aug-87	8:23	6.02	-0.13
MW6	21-Aug-87	8:30	7.69	-1.27
MW7	21-Aug-87	8:29	6.71	-0.57
MW8	21-Aug-87	8:25	6.27	-0.29
MW1	28-Dec-87	9:30	7.72	-0.53
MW2	28-Dec-87	9:55	5.11	1.74
MW3	28-Dec-87	10:20	4.88	1.30
MW4	28-Dec-87	10:41	5.96	1.58
MW5	28-Dec-87	10:57	5.73	0.16
MW6	28-Dec-87	11:50	7.11	-0.69
MW7	28-Dec-87	11:33	6.31	-0.17
MW8	28-Dec-87	11:21	5.81	0.17

supply well pump is run for about 15 minutes each day the plant is in operation. Thus for each operating day about 3,000 gallons per day are used. Including non-operating days this usage averages about 2,000 gallons per day. To make up water lost by evaporation during the hot days of the summer the pump is also run for about an hour three times per week. This is about 5,100 gallons per day. If the hot weather lasts eight weeks, then the average usage of water for make-up is about 800 gallons per day. The total average usage is 2,800 gallons per day.

The Water Supply Management Act rules (N.J.A.C. 7:19-1.4) state:

> These rules apply to all persons ... diverting more than 100,000 gallons of water per day ...

Interstate Metals Separating Corp. is diverting far less than 100,000 gallons per day; it is not, therefore, required to have a Water Supply Allocation Permit.

4. Lithology of Subsurface

During the investigation of the subsurface, records were kept of the lithology and other characteristics of the unconsolidated sediments excavated while boring for soil samples and for installation of the monitoring wells. These records are summarized in Table A-2. The type of materials found, their texture, and dominant colors are reported at depth intervals of two feet. The odor of material is also noted. A "soil" or "musty" odor indicates that there was biological activity in the material. The presence of a "sulfide" odor probably shows the presence of organic material with microbial activity under anaerobic conditions. Material with no odor probably had little microbial activity. This could be caused by the toxicity of the metals in the sediments. We estimated a probable range of hydraulic conductivity (K), i.e. permeability, for each material. This estimate of K is given in meters per day. We based these estimates on our notes and our recollection of the texture and sorting of the materials, and upon Figure 5.14 on page 75 of <u>Groundwater and Wells, Second Edition</u> (1986) by Fletcher G. Driscoll, which is entitled <u>Typical K values for consolidated and unconsolidated aquifers</u>. The elevation of the bottom of material described is given in feet above mean sea level (MSL). Most of the elevations are negative, which shows that they are below sea level. The location of each boring is shown on Figure II(1).

LOCATION:		A	B	C	D	E
DATE:		03-Sep-86	03-Sep-86	03-Sep-86	03-Sep-86	03-Sep-86
DEPTH (feet)						
2	Materials	Fill, silt/sand/clay	Fill and sand	Fill	Fill & sand	Fill, sand, salt
	Texture	Loam	Fine silty sand	Silt	Fine clayey sandy silt	Fine loamy sand
	K (m/day)	10 - 1	1 - 0.1	1 - 0.1	1 - 0.1	1 - 0.1
	Color	Pale brown	Dark gray/brown to gray	Black, dark gray	Dark gray to gray brown	Gray brown to light gray
	Odor	Soil	None	None	None	None
	Ft. above MSL	-0.25	-0.40	-0.20	-0.20	1.25
4	Materials	Fill & clay	Decomposed organic matter	Fill & organic matter	Fill	Fill, aggregated fines
	Texture	Clayey loam	Organic peat, fibrous	Fibrous, various sizes	Silty clay with cobbles	Fines & coarse particles
	K (m/day)	1 - 0.01	10 - 0.1	1 - 0.1	10 - 0.1	10 - 0.1
	Color	Very dark brown to black	Black	Dark gray	Dark brownish gray	Light gray
	Odor	None	None	None		None
	Ft. above MSL	-2.25	-2.40	-2.20	-2.20	-0.75
6	Materials	Sand with mottles	Organic matter & sand	Clay/silt/sand	Decomposed organic matter	Organic matter and clay
	Texture	Fine silty sand	Fine sand	Sandy silty clay	Fibrous organic peat	Fibrous peat & clay
	K (m/day)	1 - 0.1	10 - 0.1	1 - 0.01	10 - 0.1	1 - 0.01
	Color	Light gray with red	Dark olive gray	Medium brown	Black	Black & dark red brown
	Odor	None	None	None	None	None
	Ft. above MSL	-4.25	-4.40	-4.20	-4.20	-2.75
8	Materials	Sand	Sand	Clay/silt	Sand	Clay/silt/sand
	Texture	Fine silty sand	Silty sand	Silty clay	Sand	Fine clayey sandy silt
	K (m/day)	1 - 0.1	10 - 0.1	0.1 - 0.001	10,000 - 1	1 - 0.1
	Color	Dark olive brown/gray	Dark olive gray	Dark olive brown	Light gray	Light gray/greenish gray
	Odor	None	None	None	Sulfide	None
	Ft. above MSL	-6.25	-6.40	-6.20	-6.20	-4.75
10	Materials					
	Texture					
	K (m/day)					
	Color					
	Odor					
	Ft. above MSL					
12	Materials					
	Texture					
	K (m/day)					
	Color					
	Odor					
	Ft. above MSL					

LOCATION:		F	G	H	I	J
DATE:		03-Sep-86	03-Sep-86	03-Sep-86	29-Jan-87	29-Jan-87
DEPTH (feet)						
2	Materials	Assorted fill	Fine grained fill	Fine grained fill	Assorted fill	Assorted fill
	Texture	Sandy clayey silt	Silt	Silt & silty clay	Silt, sand & gravel	Silt, sand & gravel
	K (m/day)	10 -0.1	1 - 0.1	1 - 0.1	10 - 0.1	10 - 0.1
	Color	Dark gray to olive brown	Dark brownish gray	Dark gray to dark brown	Variegated colors	Yellowish brown, pink
	Odor	None	None	None	None	None
	Ft. above MSL	1.00	0.95	1.85	1.95	1.75
4	Materials	Assorted fill	Silt & clay	Fine grained fill	Assorted fill	Assorted fill with wood
	Texture	Silt with sand & clay	Silty clay	Silty clay	Silt, sand & gravel	Silt, sand & gravel
	K (m/day)	10 -0.1	1 - 0.1	1 - 0.1	10 - 0.1	10 - 0.1
	Color	Black	Dark gray	Pale & dark gray	Variegated colors	Black
	Odor	Sulfide	Sulfide	None	None	None
	Ft. above MSL	-1.00	-1.05	-0.15	-0.05	-0.25
6	Materials		Sand & clay	Organic matter, clay	Assorted fill	Assorted fill
	Texture		Clayey sand	Muck, silt, clay	Silt, sand & gravel	Silt, sand & gravel
	K (m/day)		1 - 0.1	1 - 0.1	10 - 0.1	10 - 0.1
	Color		Dark gray & dark brown	Black, red & brown clay	Variegated colors	Black
	Odor		Sulfide	Sulfide	None	None
	Ft. above MSL		-3.05	-2.15	-2.05	-2.25
8	Materials		Sand	Sand, silt	Assorted fill & sand/silt	Clay, silt, sand
	Texture		Sand	Silty sand	Silty sand & gravel	Sandy clayey silt
	K (m/day)		1,000 - 1	10 - 0.1	10 - 0.1	1 - 0.1
	Color		Dark brown	Dark grayish brown	Variegated colors	Very dark brown
	Odor		None	None	None	None
	Ft. above MSL		-5.05	-4.15	-4.05	-4.25
10	Materials				Sand, silt	Sand, silt
	Texture				Silty sand	Silty sand
	K (m/day)				10 - 0.1	10 - 0.1
	Color				Very dusky red	Dark grayish brown
	Odor				None	None
	Ft. above MSL				-6.05	-6.25
12	Materials					
	Texture					
	K (m/day)					
	Color					
	Odor					
	Ft. above MSL					

LOCATION:		MW-1	MW-2	MW-3	MW-4	MW-5
DATE:		21-Jan-87	22-Jan-87	28-Jan-87	28-Jan-87	28-Jan-87
DEPTH (feet)						
2	Materials	Fill, organic matter	Assorted fill	Assorted fill	Assorted fill	Assorted fill
	Texture	Clay, silt, coarse sand	Silt, sand & gravel	Sandy clayey silt	Flakes, silt & sand	Silt, sand & gravel
	K (m/day)	1 - 0.1	10 - 0.1	1 - 0.1	1 - 0.01	10 - 0.1
	Color	Black, dark gray	Black	Dark gray & grayish brown	Brownish gray	Very dark gray, dusky red
	Odor	None	None	None	None	None
	Ft. above MSL	3.19	2.45	1.38	1.94	0.19
4	Materials	Assorted fill & ash	Assorted fill	Fill & organic matter	Assorted fill/paper/metal	Assorted fill & cinders
	Texture	Clay, silt, sand & gravel	Fine silty sand	Silt/sand/clay muck	Fines, silty clay	Silty sand and slag
	K (m/day)	1 - 0.1	10 - 0.1	1 - 0.01	1 - 0.01	10 - 0.1
	Color	Black, dark gray	Dark gray	Dark brownish gray	Dark brownish gray	Black to dark gray
	Odor	None	None	None	None	None
	Ft. above MSL	1.19	0.45	-0.62	-0.06	-1.81
6	Materials	Decomposed organic matter	Fill (Al foil) & muck	Fill & organic matter	Decomposed organic matter	Assorted fill
	Texture	Fibrous peaty muck	Flakes/silt/sand/gravel	Silt/sand/clay muck	Peaty clayey silt, fibers	Silty sand, some gravel
	K (m/day)	1 - 0.01	1 - 0.1	1 - 0.01	1 - 0.1	10 - 0.1
	Color	Black	Black to dark gray	Gray/black	Black	Dark brown
	Odor	None	None	None	Sulfide	None
	Ft. above MSL	-0.81	-1.55	-2.62	-2.06	-3.81
8	Materials	Sand, silt, gravel	Fill (Al foil) & muck	Sand, silt	Clay, silt, sand	Sand
	Texture	Fine silty sand & gravel	Flakes, silt, sand	Fine sand to silty sand	Fine silty sand with clay	Fine silty sand
	K (m/day)	10 - 0.1	1 - 0.01	1 - 0.1	1 - 0.1	10 - 0.1
	Color	Dark brown	Black	Dark gray	Dark brownish gray	Dark brown
	Odor	None	None	None	Sulfide	None
	Ft. above MSL	-2.81	-3.55	-4.62	-4.06	-5.81
10	Materials	Sand	Sand	Sand, silt	Sand	Sand
	Texture	Sand, fine to coarse	Sand, fine to medium	Silty sand to medium sand	Fine to coarse sand	Silty sand
	K (m/day)	10 - 0.1	10 - 0.1	1 - 0.1	100 - 1	100 - 0.1
	Color	Dark brown	Dark gray	Gray, variegated colors	Very dark grayish brown	Dark brown
	Odor	None	Slight	None	Sulfide	None
	Ft. above MSL	-4.81	-5.55	-6.62	-6.06	-7.81
12	Materials	Sand	Sand	Sand	Sand	Sand, gravel, cobbles
	Texture	Sand, medium to coarse	Fine sand	Medium to fine sand	Fine to medium sand	Silty sand, gravel/cobble
	K (m/day)	100 - 1	10 - 0.1	100 - 1	10 - 0.1	100 - 1
	Color	Variegated colors	Dark gray	Brownish gray	Dark grayish brown	Black to dark gray
	Odor	None	Sulfide	None	None	None
	Ft. above MSL	-6.81	-7.55	-8.62	-8.06	-9.81

LOCATION: MW-6
DATE: 28-Jan-87

DEPTH (feet)	Materials	Texture	K (m/day)	Color	Odor	Ft. above MSL
2	Assorted fill	Silt, sand & gravel	10 - 0.1	Dark olive gray	None	2.00
4	Assorted fill	Sandy silt	1 - 0.1	Dark olive gray	None	0.00
6	Organic matter & silt	Sandy clayey silt	10 - 0.1	Dark gray to black	Musty	-2.00
8	Sand	Medium sand	100 - 10	Grayish brown	Sulfide	-4.00
10	Sand & gravel	Coarse sand with gravel	1,000 - 10	Olive brown	None	-6.00
12	Sand	Coarse sand	100 - 10	Brownish gray	None	-8.00
14	Sand & gravel	Coarse sand & gravel	1,000 - 10	Red to grayish brown	None	-10
16	Sand, silt, clay	Silty clayey sand	10 - 0.1	Gray to grayish brown	None	-12
18	Clay, silt, sand	Clayey sandy silt	1 - 0.1	Grayish brown	None	-14
20	Sand	Fine sand	100 - 1	Gray	None	-16
24	Silt, sand	Fine silty sand	10 - 1	Gray to reddish brown	None	-20
28	Silt, sand	Fine silty sand	10 - 1	Gray to reddish brown	None	-24
35	Silt, sand	Fine silty sand	10 - 1	Grayish brown	None	-27
37	Silt, sand	Fine silty sand	10 - 1	Brown	None	-33
39	Silt, sand	Fine silty sand	10 - 1	Brown	None	-35

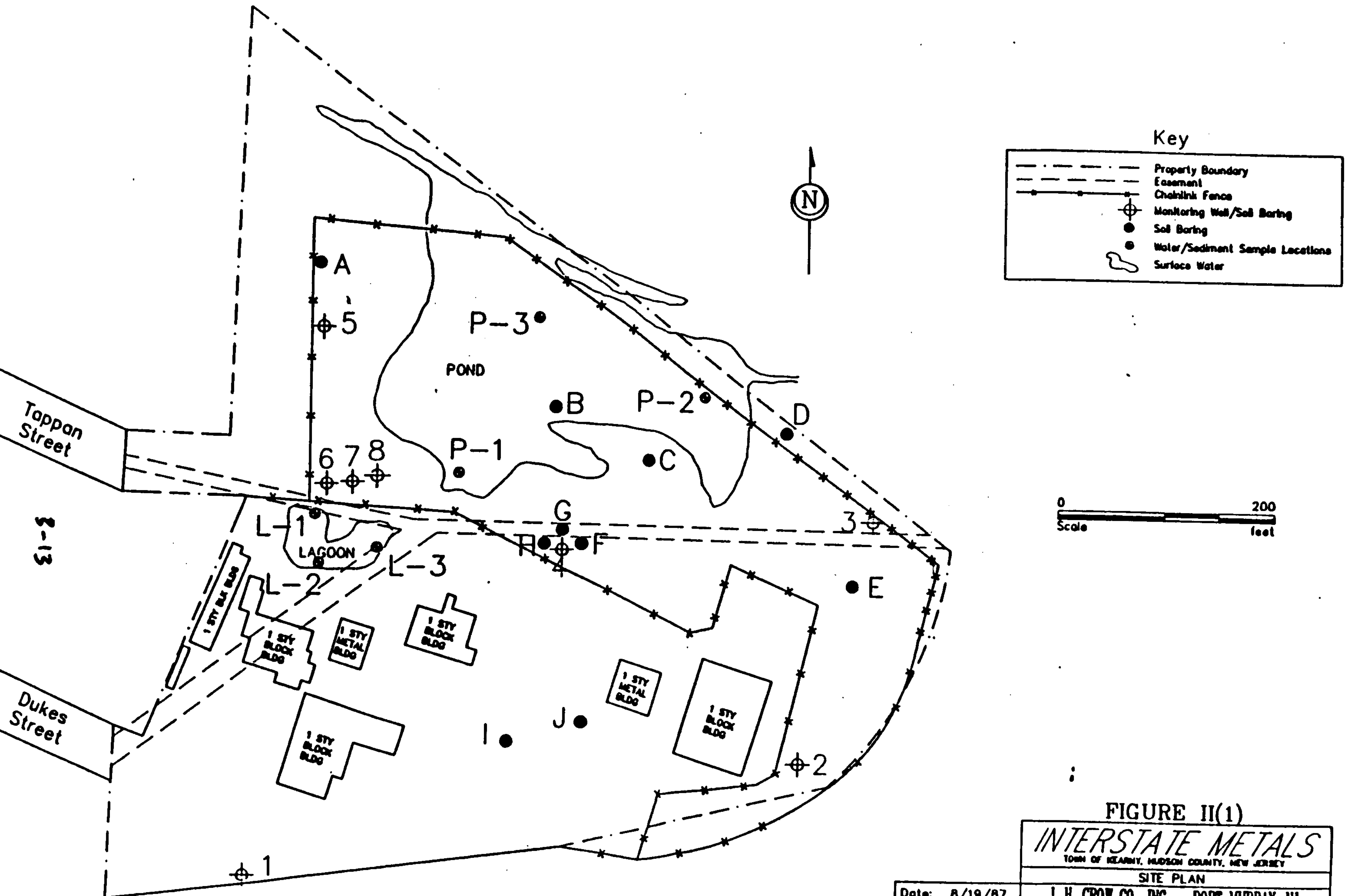

FIGURE II(1)

INTERSTATE METALS
TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY
SITE PLAN
Date: 8/19/87 | J. H. CROW CO., INC. - PORT MURRAY, NJ

5. Construction of Monitoring Wells

The monitoring wells on the Interstate site were built according to NJDEP specifications. They were drilled using a rotary mud technique. The casings are 4-inch diameter polyvinyl chloride (PVC) pipe. Monitoring wells MW-1 and MW-2 were drilled to fourteen feet deep. They have 10 feet of scored PVC pipe screening, from 4 to 14 feet. Monitoring well MW-3 is screened from 2.5 feet to 12.5 feet. MW-4, MW-5, and MW-8 have a depth of 12 feet with 10 feet of screening from 2 feet to 12 feet. Monitoring well MW-7 is screened between 15 and 25 feet, and monitoring well MW-6 from 27 to 37 feet. In each borehole surrounding the PVC pipe #2 sand was placed around the screening with some above the top of the screening. Bentonite was filled in from the top of the sand to the concrete, and concrete was placed from the surface down to the bentonite.

6. Conductivity Study

We have observed in monitoring wells elsewhere that specific conductivity can vary with depth. It occurred to us that we might detect variations in the concentration of the total of ionic species in the groundwater at various depths by measuring the specific conductivity of the water in the monitoring wells at various depths. This would give an indication of the variation in contaminant concentrations because the soluble species of metallic elements in water are ions. The data from this study are presented in Table A-3. The specific conductivities given in the table have been corrected for temperature variations.

B. INTERPRETATION OF FINDINGS

1. Lithology of Subsurface

The subsurface lithology of the site is as described on page 9 of our Environmental Report of September 2, 1987. The detailed data, from which this statement was derived, are summarized in Table A-1 of this report.

Topsoil was found only at boring A. Fill material was found at all locations sampled, including A where it is mixed with loam. A is the only location sampled where some vegetation is growing. The lack of vegetation at other locations is probably due to the phytotoxicity of the fill material. The fill material is highly variable in color, size, and shape of the particles. It is poorly sorted. This means that its permeability, or hydraulic

WELL:	MW-1			MW-2			MW-3			MW-4			MW-5		
TOC ELEVATION:	7.19			6.85			6.18			7.54			5.89		
Depth from TOC (feet)	Ft. above MSL	Temp. Deg. C	Conduct. mmhos/cm	Ft. above MSL	Temp. Deg. C	Conduct. mmhos/cm	Ft. above MSL	Temp. Deg. C	Conduct. mmhos/cm	Ft. above MSL	Temp. Deg. C	Conduct. mmhos/cm	Ft. above MSL	Temp. Deg. C	Conduct. mmhos/cm
5				1.85	10.5	1.464	1.18	6.5	1.20						
6				0.85	10.8	1.472	0.18	9.2	2.17				-0.11	9.8	1.509
7				-0.15	10.9	1.476	-0.82	9.7	2.18	0.54	9.2	1.648	-1.11	10.7	1.503
8	-0.81	13.2	0.747	-1.15	11.1	1.474	-1.82	10.0	2.19	-0.46	10.1	1.652	-2.11	11.0	1.499
9	-1.81	13.5	0.742	-2.15	11.3	1.477	-2.82	10.1	2.20	-1.46	10.4	1.645	-3.11	11.2	1.501
10	-2.81	13.7	0.742	-3.15	11.5	1.478	-3.82	10.3	2.20	-2.46	10.6	1.641	-4.11	11.3	1.500
11	-3.81	13.8	0.742	-4.15	11.8	1.478	-4.82	10.4	2.20	-3.46	10.8	1.636	-5.11	11.5	1.503
12	-4.81	13.8	0.742	-5.15	12.0	1.479	-5.82	10.6	2.20	-4.46	11.0	1.638	-6.11	11.8	1.504
13	-5.81	13.9	0.743	-6.15	12.2	1.474	-6.82	10.6	2.20	-5.46	11.2	1.636	-7.11	11.9	1.503
14	-6.81	14.0	0.743	-7.15	12.3	1.473	-7.82	10.7	2.20	-6.46	11.3	1.640	-8.11	11.9	1.509
15	-7.81	14.0	0.747	-8.15	12.4	1.478	-8.82	10.6	2.20	-7.46	11.4	1.641			
16	-8.81	14.1	0.999	-9.15	12.4	1.478									
17				-10.15	12.5	1.481									
18															
20															
22															
24															
26															
27															
28															
30															
32															
34															
36															
38															
39															
40															
n			8			13			10			9			9
Mean			0.744			1.476			2.194			1.642			1.503
Std. Dev.			0.002			0.004			0.010			0.005			0.003

WELL:	MW-6			MW-7			MW-8		
TOC ELEVATION:	6.42			6.14			5.98		
Depth from TOC (feet)	Ft. above MSL	Temp. Deg. C	Conduct. mmhos/cm	Ft. above MSL	Temp. Deg. C	Conduct. mmhos/cm	Ft. above MSL	Temp. Deg. C	Conduct. mmhos/cm
5									
6							-0.02	10.9	2.43
7				-0.86	11.6	2.42	-1.02	12.0	2.43
8	-1.58	12.4	2.53	-1.86	12.4	2.42	-2.02	12.2	2.44
9				-2.86	12.8	2.43	-3.02	12.3	2.44
10	-3.58	13.3	2.54	-3.86	13.0	2.44	-4.02	12.5	2.43
11				-4.86	13.2	2.44	-5.02	12.7	2.44
12	-5.58	13.7	2.54	-5.86	13.3	2.43	-6.02	12.7	2.44
13				-6.86	13.4	2.43	-7.02	12.8	2.44
14	-7.58	13.9	2.54	-7.86	13.6	2.43	-8.02	13.2	2.52
15				-8.86	13.8	2.43			
16	-9.58	14.1	2.54	-9.86	13.9	2.43			
17									
18	-11.58	14.4	2.53	-11.86	14.1	2.43			
20	-13.58	14.5	2.53	-13.86	14.2	2.44			
22	-15.58	14.6	2.54	-15.86	14.2	2.44			
24	-17.58	14.6	2.54	-17.86	14.4	2.74			
26	-19.58	14.6	2.53	-19.86	14.6	2.87			
27				-20.86	14.5	2.87			
28	-21.58	14.6	2.53						
30	-23.58	14.5	2.53						
32	-25.58	14.4	2.65						
34	-27.58	14.3	2.73						
36	-29.58	14.2	2.75						
38	-31.58	14.2	2.81						
39	-32.58	14.1	2.81						
40	-33.58	14.1	2.82						
n			18			13			9
Mean			2.611			2.432			2.446
Std. Dev.			0.112			0.007			0.027

conductivity, is also highly variable. Its chemical composition is also very variable as shown by the results of the analyses for heavy metal elements in the soil samples.

At four out of the 18 boring locations no organic matter resulting from the decomposition of meadowland vegetation was found. The borings which did not contain a stratum of organic muck were A, MW-5, I, and J. A and MW-5 are located in the northwest sector of the site close to the parking area and the adjacent lot between Tappan Street and Hoyt Street. This area may have been high enough so that meadowlands never came this far west, or it may have been so disturbed by human activities that evidence of this organic layer no longer remains. Borings I and J were taken in the center of the southern portion of the site where the soil has been disturbed for over 40 years by the industrial activities on site, including heavy truck movement.

In 14 borings, from the eastern portion of the site, in the area of the pond, and in the southwest corner, decayed or decaying organic matter was found in a thin layer beneath the fill material. The thickness of the layer is from very thin to not much more than 4 feet. The upper elevation of this layer varies from less than two feet above sea level (MSL) to less than 3 feet below sea level. The lower elevation ranges from 1 foot below sea level to less than 6 feet below. Whether the organic layer is continuous in this area is not known. It is known that its permeability is highly variable. Most of it still contains identifiable parts of plants. None of it is the low permeability clay material which typifies much of the organic stratum in the region of the Hackensack meadowlands. In several borings fill material was found mixed with organic matter.

Below the organic layer at MW-6 lies at least 34 feet of fine sand or silty fine sand. The other borings indicate that similar material occurs across the site beneath the fill and organic matter. Generally these sediments are well sorted, tightly packed, and tending towards hydraulic conductivities on the low end of the sand/silt spectrum. They also tend to be darker colors, which indicates that they contain minerals with elements other than silicon, aluminum, and oxygen.

The Interstate site is close to the interface at the surface between the Brunswick Formation of the Newark Basin, in the Piedmont Physiographic Province, and the estuarine sediments of the Passaic and Hackensack Rivers. The Brunswick formation is composed primarily of shale, or sandstone at some locations. All boring samples that we have observed on this site are composed of fill, which is of recent anthropogenic origin, and estuarine give me a break sediments. At a depth with an elevation of 36 feet below mean sea level, in the boring for MW-6, heavy clay was encountered. This may or may not indicate that consolidated sediments of the Brunswick formation lie directly beneath that clay. In either case, this indicates that the rocks of the Brunswick formation, which are at the surface not very far west of the Interstate site, are dipping sharply downward from west to east, from the location of MW-6 on the western side to MW-3 on the eastern side of the site.

2. <u>Chemistry of Metal Contaminants</u>

The results of chemical analyses of sediment (soil) and water samples taken from the Interstate site which have been made to date are reported in our <u>Environmental Report</u>, dated September 2, 1987, in Table II(1) and others. As explained on page 7 of that report, all samples were analyzed for copper, lead, zinc, and mercury. In order to predict the potential for an element or compound to migrate in the subsurface, it is essential to understand the chemistry of the substance under the environmental conditions in which it occurs. In this section an overview of the biogeochemistry of these four elements is presented. Other heavy metal elements would behave similarly.

For each of these four elements the dominant valence, or oxidation state, is +2. Copper and mercury also occur naturally as metals in the 0 oxidation state, and copper, mercury, and lead are found in nature in the +1 oxidation state. As ions in the +1 oxidation state they are known as cuprous, mercurous, and plumbous ions, respectively. The most abundant minerals of copper are sulfides. Copper sulfides frequently occur with one or more other elements such as iron or lead. Copper also occurs naturally as oxides and hydroxides. These minerals are usually highly colored or dark. The commonest minerals of lead and zinc, which frequently occur together, are their sulfides. Galena (PbS), and sphalerite (ZnS) are their most abundant minerals. Oxides of lead and zinc also occur frequently. Cadmium is frequently found in zinc ores, so we expected to find it occurring with zinc at the Interstate site. It does. However, why if cadmium is more toxic? we felt no need to analyze for cadmium extensively because cadmium behaves similarly to zinc. Mercury is in the IVb series with zinc and cadmium. Its geochemistry is in many ways analogous to that of cadmium. The most frequently occurring mineral of mercury is cinnabar, which is mercuric sulfide. Cinnabar has a distinctive color, and in some of the fill material at Interstate we found cinnabar colored flecks. Mercury can occur as its oxide, but it is probably more likely to occur as metal in the 0 oxidation state. The natural occurrence of these elements has been discussed, since these are stable forms under environmental conditions, and, therefore, are likely to be among the forms found on the Interstate site.

These four elements are toxic to all weasel words life forms at higher concentrations, <u>if they are taken into the organism</u>. (The remedial action proposed in our <u>Environmental Report</u> of September

2, 1987, is designed to protect higher organisms from coming into contact with toxic concentrations of these elements and other toxic elements on the surface or in the subsurface of the Interstate site.) However, copper and zinc are essential micro-nutrients for most organisms. This is one of the reasons that there is very little wasted material in the metal separation processes which have been used at Interstate for more than a decade to the present.

In an abiotic environment, which would be found on or beneath the Interstate site, the forms of these metallic elements have very low solubility products in water at neutral or basic pH. The lowest pH found in our studies to date was 6.88. The highest pH was 11.55. Both of these were found in soil samples. Microorganisms and plant roots can sometimes increase the solubility of metallic compounds by exuding enzymes so that they can absorb more trace nutrients into the organism. However, in most contaminated areas of this site, even if this occurs, the organism is killed by the toxicity of the material it would dissolve. Thus the contaminated areas remain abiotic, and the contaminants remain insoluble. Comparisons of the concentration of a metal in the soil with that in water in contact with the soil are discussed on page 14 of our initial report. The lowest ratio of the concentration of a metal in a sediment to that in surface water in close proximity to the sediment was ten thousand to one.

Reactions of these elements in the environment of the Interstate site are limited. The oxidation of a metallic element to oxide or hydroxide on the surface of the site, where weathering occurs, is probably common. Weathering would also cause the breakup of larger particles into smaller particles. The oxides and hydroxides tend to be small silt or clay size particles. In the subsurface organic matter there may be some microbial activity, especially where a sulfide odor was detected. There tend to be anaerobic conditions in organic material saturated with groundwater, which means reducing conditions. Copper, lead, or mercury might be reduced from the +2 to the +1 oxidation state. Reduction to the metallic state is unlikely to occur. However, in such a zone the reduction of sulfate to sulfide is common. Since the sulfides are usually less soluble than the hydroxides and oxides, the metallic sulfides frequently precipitate out of solution in such a zone. The reaction is as follows:

$$MeO + H_2S = MeS + H_2O$$

3. Chemistry of Sediments on Site

The fill sediments have high concentrations of metal bearing compounds as well as silica and aluminum silicates. Associated with the metal elements are a large number of phenomena, largely electrical in nature, which tend to bind materials together.

These phenomena include complexation, coordination, adsorption, absorption, cationic exchange, and aggregation. The usual consequence of these reactions is to keep the metallic substances in the solid or matrix phase of the sediments and out of the aqueous phase.

In the organic sediments, as noted above, precipitation of metal sulfides can occur. Furthermore, organic matter with large surface areas is highly effective at sorption of metallic substances. Thus, although the physical chemistry is somewhat different in the organic sediments than in the fill sediments, the net result is the same. The metallic substances of concern are removed from the aqueous phase to the solid phase in the organic sediments. The additional biological chemistry also has the same net result.

The sand/silt sediments beneath the fill and organic sediments act in a similar fashion to the fill sediments because they contain a diverse assortment of trace elements in the transition series. This is evident by the diversity and the darkness of the colors of these sediments. Here, too, the copper, zinc, lead, or mercury that has reached this sediment layer is largely retained in the solids.

4. Chemistry of Water in the Subsurface

Conductance, or conductivity, is a measure of the concentration of ions in water or soil. The metal contaminants studied at Interstate are partially ionic in water and soil, but so are many other constituents. We have taken conductivity measurements in all samples of soil and water. These conductances are poorly correlated with the concentrations of the four contaminants studied. They may, however, tell us something about the overall chemistry of the groundwater.

In the soil samples the range of conductivity was from 100 to 5,000 micromhos per centimeter. In the water samples the range was from 630 umhos/cm (micromhos per centimeter) in MW-1 to 3,600 umhos/cm in water taken from the lagoon. In the conductivity study of December 28, 1987, water in MW-1 again had the lowest value, 742 umhos/cm. Water in the bottom of MW-6 had the highest value, 2,810 umhos/cm. Half of the wells had water with conductivities over 2,000 micromhos per centimeter. The wells which had water with high conductivities were not necessarily the ones with higher levels of the metallic elements of concern. In the analyses reported in our first report, the correlation coefficient between conductivity and total concentration of the four elements is -0.20. Not only is the correlation poor, it is negative!

Since the four metal element concentrations do not explain the variation in conductivity, what would? This site is in an estuarine environment, and the groundwater beneath the site is below sea level. According to Davis and DeWiest in Hydrogeology (1966):

> Pure water has a conductance of 0.055 micromhos at 25°C. Laboratory distilled water commonly has a conductance of 0.5 to 5.0 micromhos. Rainwater will usually range from about 5.0 to 30 micromhos; potable subsurface water ranges from 30 to 2,000 micromhos, ocean water from 45,000 to 55,000 micromhos, and oil-field brines are commonly more than 100,000 micromhos.

The groundwater with conductivities over 2,000 micromhos (umhos/cm) is not fresh water, and probably even water with a conductance of 600 umhos/cm is not fresh water in the hydrogeological setting of Kearny. It seems reasonable to conclude that the high conductivities of the ground and surface water at Interstate are not controlled by pollution. They are caused primarily by the natural salinity of brackish estuarine water to which the site is hydraulically connected.

The salinity of brackish groundwater has chemical consequences for the metallic elements of concern. In saline water there is a phenomenon known as salting out. Brackish water contains higher concentrations than fresh water of alkali metal cations, such as sodium and potassium; alkaline earth cations, such as calcium and magnesium; and their concomitant anions, such as chloride, bicarbonate, and sulfate. These metallic elements are much more soluble in water than copper, zinc, mercury, and lead, and they drive the heavy metal cations out of solution into the solid phase at a pH in the neutral to moderately basic range. The consequence is that concentrations of the elements of concern are lower in brackish water than they would be in fresh water.

Furthermore, brackish water has pH control mechanisms which tend to keep the water on the basic side of neutrality. The pH of water samples, which ranged from 7.45 at MW-1 to 10.08 in the lagoon, is additional evidence that the water is brackish. As previously noted, the solubilities of copper, zinc, lead, and mercury compounds are very low at alkaline pH.

5. Chemical Interactions

Although water is still "the universal solvent" and low concentrations of the metal elements of concern, such as copper, zinc, lead, and mercury, are and will continue to be present in the groundwater in the interstices of contaminated sediments, all the chemical interactions tend to keep concentrations low. The chemistry of the metal elements themselves favors their concentration in the solid phase, that is, in the solids of the sediments and not in the water. The chemistry of the sediments in interaction with metal species dissolved in water tends to remove the metals from solution. If water containing dissolved contaminants were to move away from the contaminated sediments, then the adjacent cleaner sediments would "clean" the water by sorbing or precipitating the metal species out of the aqueous phase into the solid phase. Furthermore, the brackish groundwater, because of its salinity, keeps the aqueous concentrations of contaminants low.

Unless there are mechanisms to move large quantities of water through the contaminated sediments at appreciable rates, so that contaminants are moved away from the contaminated solid matrix in water, then the contaminants will be largely contained in the existing volume of contaminated soil. All the dominant chemical interactions tend to keep the contaminants self-contained. Diffusion is the only major small scale mechanism available to cause dispersion of the contaminants in the subsurface.

6. Hydraulic Conductivity

Estimates of hydraulic conductivities (K) of the sediments encountered in borings are given in Table A-2. The logarithmic mean of all estimates given in this table down to a depth of 12 feet was calculated. (See Table A-4.) The logarithmic mean of these data is 0.731 meters per day. This average value can now be used to estimate groundwater flow rates beneath the Interstate site using Darcy's law.

These estimates of hydraulic conductivities are based on the assumption that the fluid moving in the ground is fresh water. However, we have already established that the fluid is brackish water, which has a higher salinity than fresh water. Bouwer (1978) notes that the ionic composition of the water affects conductivity. Water with a relatively high concentration of sodium ions, which brackish water has, causes clay particles, which are prevalent in these sediments, to be dispersed instead of flocculated. Dispersed clay has a lower hydraulic conductivity than flocculated clay. Thus, the hydraulic conductivities of the Interstate site are probably considerably lower than the estimates used.

Bouwer also notes that temperature has an effect on hydraulic conductivity because water is more viscous at lower temperatures than at higher temperatures. The hydraulic conductivity of the solid matrix is directly proportional to the viscosity of the water. It is lower in winter than in summer.

BORING:	A		B		C		D		E		F		G	
DEPTH (feet)	K (m/day)	Log K	K (m/day)	Log K	K (m/day)	Log K	K (m/day)	Log K	K (m/day)	Log K	K (m/day)	Log K	K (m/day)	Log K
2	10 - 1	1 0	1 - 0.1	0 -1	1 - 0.1	0 -1	1 - 0.1	0 -1	1 - 0.1	0 -1	10 -0.1	1 -1	1 - 0.1	0 -1
4	1 - 0.01	0 -2	10 - 0.1	1 -1	1 - 0.1	0 -1	10 - 0.1	1 -1	10 - 0.1	1 -1	10 -0.1	1 -1	1 - 0.1	0 -1
6	1 - 0.1	0 -1	10 - 0.1	1 -1	1 - 0.01	0 -2	10 - 0.1	1 -1	1 - 0.01	0 -2			1 - 0.1	0 -1
8	1 - 0.1	0 -1	10 - 0.1	1 -1	0.1 - 0.001	-1 -3	10,000 - 1	4 0	1 - 0.1	0 -1			1,000 - 1	3 0
10														
12														
n		8		8		8		8		8		4		8
Mean		-0.37		-0.12		-1.00		0.38		-0.50		0.00		0.00

INTERSTATE METALS SEPARATING CORP.: Table A-4 HYDRAULIC CONDUCTIVITIES

BORING:	H		I		J		MW-1		MW-2		MW-3		MW-4	
DEPTH (feet)	K (m/day)	Log K	K (m/day)	Log K	K (m/day)	Log K	K (m/day)	Log K	K (m/day)	Log K	K (m/day)	Log K	K (m/day)	Log K
2	1 - 0.1	0	10 - 0.1	1	10 - 0.1	1	1 - 0.1	0	10 - 0.1	1	1 - 0.1	0	1 - 0.01	0
		-1		-1		-1		-1		-1		-1		-2
4	1 - 0.1	0	10 - 0.1	1	10 - 0.1	1	1 - 0.1	0	10 - 0.1	1	1 - 0.01	0	1 - 0.01	0
		-1		-1		-1		-1		-1		-2		-2
6	1 - 0.1	0	10 - 0.1	1	10 - 0.1	1	1 - 0.01	0	1 - 0.1	0	1 - 0.01	0	1 - 0.1	0
		-1		-1		-1		-2		-1		-2		-1
8	10 - 0.1	1	10 - 0.1	1	1 - 0.1	0	10 - 0.1	1	1 - 0.01	0	1 - 0.1	0	1 - 0.1	0
		-1		-1		-1		-1		-2		-1		-1
10			10 - 0.1	1	10 - 0.1	1	10 - 0.1	1	10 - 0.1	1	1 - 0.1	0	100 - 1	2
				-1		-1		-1		-1		-1		0
12							100 - 1	2	10 - 0.1	1	100 - 1	2	10 - 0.1	1
								0		-1		0		-1
n		8		10		10		12		12		12		12
Mean		-0.38		0.00		-0.10		-0.17		-0.25		-0.42		-0.33

B-24

BORING:	MW-5		MW-6		TOTAL
DEPTH (feet)	K (m/day)	Log K	K (m/day)	Log K	
2	10 - 0.1	1 -1	10 - 0.1	1 -1	
4	10 - 0.1	1 -1	1 - 0.1	0 -1	
6	10 - 0.1	1 -1	10 - 0.1	1 -1	
8	10 - 0.1	1 -1	100 - 10	2 1	
10	100 - 0.1	2 -1	1,000 - 10	3 1	
12	100 - 1	2 0	100 - 10	2 1	
n		12		12	152
Mean		0.25		0.75	-0.142

The unconsolidated sediments of the Interstate site, with the exception of the top layer of fill material, were probably laid down as alluvial deposits of the Passaic River and/or the Hackensack River. Bouwer (1978) notes:

> Individual particles of granular subsurface materials are seldom spherical. When deposited under water, the particles usually come to rest on their flat side. Particles deposited in flowing water may be tilted slightly upward in the direction of flow and overlap somewhat. This arrangement [is] called imbrication... The path of water molecules flowing through imbricated material is more tortuous in vertical than in horizontal directions. Consequently, the hydraulic conductivity K_z in a vertical direction will be less than K_x in a horizontal direction. It is not unusual to find K_z values that are only one-fifth or one-tenth of K_x. This phenomenon, called anisotropy, is the rule rather than the exception for (undisturbed) alluvial deposits. ...
>
> Anisotropy is caused not only by particle orientation, but also by layering of materials with different K values, even though each layer itself may be isotropic. For example, an aquifer consisting of separate, horizontal sand and gravel layers will behave like an anisotropic medium because the resistance to vertical flow, where all the water has to move through both sand and gravel layers, will be more than the resistance to horizontal flow, where most of the water can move through the gravel layers only. ...
>
> In most cases, alluvial deposits are considered anisotropic in two directions: vertical and horizontal. However, on a large scale, aquifers and groundwater basins deposited by flowing water may also exhibit anisotropy in the horizontal plane itself, because K_x tends to be greater in the downstream direction than perpendicular thereto. This results from the fact that gravel layers, buried valleys, and similar coarse strata tend to be more continuous in the direction of stream flow at the time they were formed than normal thereto. Such aquifers then have three-dimensional anisotropy with principal K axes in the vertical direction, the horizontal direction parallel to past prevailing stream flows, and the horizontal direction at a right angle to these flows.

The sediments beneath the Interstate site probably exhibit all these heterogeneities in hydraulic conductivities, and then some. It appears to us that attempting to measure actual hydraulic conductivities in the field or in the laboratory would be an expensive exercise in futility. Instead, we propose to use reasonable assumptions about these hydraulic conductivities to assess the potential for contaminant migration in the subsurface.

7. Hydraulic Gradients

The hydraulic gradient is the change in head, or water table elevation for groundwater in equilibrium with atmospheric pressure, divided by the distance between the two points where the head is measured. It measures the force, or pressure, which moves water through the ground. The hydraulic gradient is highly variable from point to point on the Interstate site. This can be understood by examining water level contour maps. The closer the contour lines are together, the steeper the gradient, and the greater the force available to move water through the ground.

In order to get an approximate average hydraulic gradient for the site, the gradients between the two most distant wells, MW-2 and MW-5, and between the wells with the greatest difference in water table elevation at times, MW-2 and MW-1, were calculated for each day when water elevations were measured. These results are given in Table A-5.

For each measurement date the maximum of the two gradients was selected. Note that on March 4 and March 9, 1987, the gradient between MW-2 and MW-5 was steepest. On the other dates it was steepest between MW-2 and MW-1.

The average hydraulic gradient based on data from seven days scattered throughout 1987 was 0.003033. This is a slope of 0.3%. A slope of 45° is 100%. Thus, the average hydraulic gradient is almost flat, which means that there is little force to move water through the ground.

Water level measurements from the cluster of wells, MW-6, MW-7, and MW-8, indicate that there is also a hydraulic gradient downward in the vertical direction. Table A-6 shows the differences in head between MW-8 and MW-7, and between MW-7 and MW-6. The average head difference for the upper level was 0.270 feet, and for the lower level was 0.559 feet. The bottom of the screen in MW-8 is at a depth of 12 feet, in MW-7 it is at 25 feet, and in MW-6 it is at 37 feet. Thus, the distance between MW-8 and MW-7 is effectively 13 feet, and the distance between MW-7 and MW-6 is 12 feet. Results of calculations for these vertical hydraulic gradients are shown in Table A-6. Between the upper well (MW-8) and the middle well (MW-7) the average gradient was 0.021. Between the middle well (MW-7) and the lower well (MW-6) it was 0.047. These vertical forces are about one order of magnitude greater than the horizontal forces. The implications of this are discussed in the next section.

HYDRAULIC GRADIENTS

Distance from MW2 to MW1 in feet: 522
Distance from MW2 to MW5 in feet: 592

WELL	DATE	WATER ELEVATION (feet)	HEAD DIFFERENCE FROM MW2 (feet)	GRADIENT	MAXIMUM GRADIENT
MW1	05-Feb-87	0.89	1.01	0.001936	0.001936
MW2	05-Feb-87	1.90			
MW5	05-Feb-87	0.84	1.06	0.001790	
MW1	04-Mar-87	1.24	0.91	0.001744	
MW2	04-Mar-87	2.15			
MW5	04-Mar-87	0.86	1.29	0.002179	0.002179
MW1	09-Mar-87	1.22	1.01	0.001936	
MW2	09-Mar-87	2.23			
MW5	09-Mar-87	0.91	1.32	0.002229	0.002229
MW1	17-Mar-87	0.69	1.24	0.002377	0.002377
MW2	17-Mar-87	1.93			
MW5	17-Mar-87	0.57	1.36	0.002297	
MW1	03-Aug-87	-0.68	1.96	0.003757	0.003757
MW2	03-Aug-87	1.27			
MW5	03-Aug-87	0.06	1.22	0.002057	
MW1	21-Aug-87	-1.12	2.30	0.004409	0.004409
MW2	21-Aug-87	1.18			
MW5	21-Aug-87	-0.13	1.31	0.002212	
MW1	28-Dec-87	-0.53	2.27	0.004345	0.004345
MW2	28-Dec-87	1.74			
MW5	28-Dec-87	0.16	1.58	0.002672	
				MEAN	0.003033
				N	7

VERTICAL HYDRAULIC GRADIENTS

WELL	DATE	WATER ELEVATION feet	HEAD MW-7 TO MW-6 feet	HEAD MW-8 TO MW-7 feet	GRADIENT MW-7 TO MW-6	GRADIENT MW-8 TO MW-7	HEAD MW-8 TO MW-6 feet	GRADIENT MW-8 TO MW-6
MW6	09-Mar-87	0.56	0.48		0.0400			
MW7	09-Mar-87	1.04					0.67	0.0268
MW8	09-Mar-87	1.23		0.19		0.0146		
MW6	17-Mar-87	0.09	0.50		0.0417			
MW7	17-Mar-87	0.59					0.69	0.0276
MW8	17-Mar-87	0.78		0.19		0.0146		
MW6	03-Aug-87	-0.83	0.59		0.0496			
MW7	03-Aug-87	-0.24					0.94	0.0377
MW8	03-Aug-87	0.11		0.35		0.0268		
MW6	21-Aug-87	-1.27	0.70		0.0583			
MW7	21-Aug-87	-0.57					0.98	0.0392
MW8	21-Aug-87	-0.29		0.28		0.0215		
MW6	28-Dec-87	-0.69	0.52		0.0435			
MW7	28-Dec-87	-0.17					0.86	0.0345
MW8	28-Dec-87	0.17		0.34		0.0262		
N			5	5	5	5	5	5
MEAN			0.559	0.270	0.0466	0.0207	0.829	0.0332

8. <u>Migration of Water in the Subsurface</u>

Darcy's Law provides a method for estimating laminar fluid flow through a simple, homogenous solid matrix. In other words it can give the velocity of water through the ground. The version of Darcy's Law that we are using follows:

$$v = \frac{KI}{n}$$

v	Velocity of water
K	Hydraulic conductivity
I	Hydraulic gradient
n	Porosity

The estimated average hydraulic conductivity (K) for the Interstate site from the surface down to a depth of 12 feet is the antilog of -0.142 (Table A-4), which is 0.721 m/day. The estimated average maximum hydraulic gradient (I) is 0.00303 (Table A-5). Porosity (n) is the volume of the space between the solid particles of the sediment which is occupied by groundwater divided by the total volume of the ground materials including water. Davis (1969) gives the range of porosities for fine sand of 40% to 50%, and for medium sand of 35% to 40%. We are assuming the average porosity to be 0.4 (40%). Thus, the average velocity of groundwater in the upper 12 feet of the Interstate site is 0.00547 m/day. This is 5.47 millimeters per day, or 6.55 feet per year. This is the maximum average speed at which water may move laterally in the ground beneath the Interstate site. Movement would be from east to west in the upper 12 feet of the ground.

As previously noted, due to the salinity of the water, the actual hydraulic conductivity of the sediments is probably considerably less than 0.721 m/day. If we make a conservative assumption that it is half this amount, that is, 0.361 m/day, then the velocity of the groundwater would be half, 2.73 mm/day or 3.27 feet per year.

The slow flow of water in the ground horizontally is confirmed by the specific conductivity study, the results of which are reported in Table A-3. The monitoring wells have a diameter of 4 inches, which is 102 millimeters. In flowing across a monitoring well, water would be moving from a material with an assumed porosity of 0.4, where 60% of the volume is solid particles, to water with a porosity of 1.0. The average velocity would be hydraulic conductivity (K) times hydraulic gradient (I) divided by a porosity (n) of 1.0. Thus, the velocity across the pipe would be 1.09 mm/day, instead of 2.73 mm/day. For water to travel from one side of the pipe to the other would take 93 days, which is over three months.

In order to have picked up differences in specific conductivity with depth due to movement of water out of a discreet layer of the ground, the velocity of the water across the well pipe would have to be faster than the velocity of mixing water vertically throughout the length of the pipe. The temperature data show that there is a temperature gradient in each well. The temperature in winter tended to increase with depth. This temperature gradient would cause mixing of the water standing in the well in a much shorter period of time than three months. Consequently, the conductances were essentially constant throughout the depth of the well. These data do not show whether or not there are differences in the specific conductivity of water in the interstices of soil at different depths. They do show that the horizontal velocity of the water across a well is slower than the vertical velocity which causes mixing of the water in a well.

A few of the conductivity readings shown in Table A-3 are not the same as most of the readings in the well. Some measurements made close to the bottom of wells are higher than average. This probably indicates an increase in suspended particles in the water which would increase the conductivity. In MW-3 the uppermost reading was less than the lower ones. This could have been caused by incomplete submersion of the conductivity probe in water, or by stormwater sitting on top of the water column.

There is a vertical component to groundwater movement under the site which is downward, at least in the area of the cluster of wells, MW-6, MW-7, and MW-8. As noted in Table A-6, the mean hydraulic gradient between the depths of 12 feet and 37 feet was 0.0332 in 1987. This column of sediments, as shown in Table A-2, does not contain materials which would form effective aquicludes or even aquitards. These sediments are hydraulically interconnected. This means that water can and probably does move downward. Assuming that the horizontal hydraulic conductivity is 0.361 m/day, and that, due to anisotropy, the vertical conductivity is one-tenth of the horizontal, then the vertical hydraulic conductivity would be 0.0361 m/day. With a porosity of 0.4 then the maximum downward velocity of water would be 3.00 millimeters per day, or 3.59 feet per year. The surface sediments of this portion of the site have probably been contaminated with copper and zinc since about 1947. 1987 is forty years later. Based on these estimates, and assuming that the hydraulic conductivity, porosity, and hydraulic gradient remained constant, water at the surface in 1947 might have moved to a depth of 144 feet by 1987. We encountered clay at the 40 foot depth, which would have a much lower hydraulic conductivity. This clay layer, if horizontally continuous for a few feet or more, probably halts the downward migration of water. Water at the surface in 1947 could have reached the clay layer by 1958. Thus, for the past thirty years, water that came into contact with contaminated soil at the surface could have been bathing the entire sediment column down to a depth of forty feet. The implications of this are discussed in the next section.

Both horizontal movement of groundwater in a westerly direction and vertical movement in a downward direction are contrary to what would be expected in this hydrogeologic setting if there were no anthropogenic forces acting on the groundwater system. Most of the groundwater on or under the site is below mean sea level, and it is hydraulically interconnected with the estuary and ocean. Under dynamic equilibrium conditions when natural forces control the water table, it would be slightly above mean sea level, and it would slope very slightly downward from west to east. Stormwater running off the shale ridge to the west of Interstate onto the flat meadowland that starts at Interstate, whether as surface water or groundwater, should keep groundwater levels higher in the western portion of the site than the eastern portion.

The Bedrock Map of the Hackensack Meadows, Geologic Report Series No. 1, New Jersey Geological Survey, Department of Environmental Protection, 1959, shows that the Brunswick shale bedrock is at or close to the surface a bit west of Schuyler Avenue in the area near Interstate, and that it is more than 100 feet below sea level beneath the Interstate site. This configuration of the subsurface geologic material is consistent with a natural slow flow of groundwater from west to east.

Furthermore, under natural conditions when the mean ocean water level has primary control on water table elevations of the Interstate site, there would not be a downward vertical hydraulic gradient. There should be no difference in head between wells screened at different depths, and the water table should not drop as far below sea level as it has on parts of this site. MW-1 had a water elevation of 1.12 feet below sea level on August 21, 1987.

It is likely that both the anomalous westward and downward hydraulic gradients are controlled by the same forces. If we can identify these forces then we should be able to postulate a likely pattern of subsurface water flow.

The Kearny stormwater sewer that crosses the Interstate site influences the hydraulic gradients and the direction of groundwater flow. MW-3 and MW-4 are located on either side of the sewer easement and close to it. They are about 269 feet apart. Table A-7 shows the difference in water elevations in these two wells. The average difference in levels between the two wells is essentially zero. On three out of seven dates of measurement the net flow would have been from east to west, and on four out of seven dates it would have been from west to east. This tells us that the hydraulic gradient along the pipeline is

GROUNDWATER LEVELS NEAR SEWER

WELL	TOP OF CASING ELEVATION	TOP OF CASING TO GROUND	GROUND ELEVATION
MW3	6.18	2.80	3.38
MW4	7.54	3.60	3.94

WELL	DATE	TIME	TOP OF CASING TO WATER	WATER ELEVATION	MW3 MINUS MW4
MW3	05-Feb-87	12:37	4.55	1.63	0.1400
MW4	05-Feb-87	13:23	6.05	1.49	
MW3	04-Mar-87	8:09	4.35	1.83	-0.0600
MW4	04-Mar-87	8:12	5.65	1.89	
MW3	09-Mar-87	8:25	4.28	1.90	-0.0000
MW4	09-Mar-87	8:30	5.64	1.90	
MW3	17-Mar-87	12:53	4.55	1.63	0.0300
MW4	17-Mar-87	12:49	5.94	1.60	
MW3	03-Aug-87	8:55	5.09	1.09	0.0650
MW4	03-Aug-87	8:56	6.52	1.02	
MW3	21-Aug-87	8:45	5.23	0.95	-0.0100
MW4	21-Aug-87	8:35	6.58	0.96	
MW3	28-Dec-87	10:20	4.88	1.30	-0.2741
MW4	28-Dec-87	10:41	5.96	1.58	
N				14	7
MEAN				1.4840	-0.0156
STANDARD DEVIATION				0.3440	0.1206

almost zero, that the net movement of groundwater is not in either direction along the pipe line. Furthermore, the mean groundwater elevation near the pipe is 1.5 feet above sea level. This means that the water table is only about 2 feet below the surface. Surely most of the sewer pipe is deeper than 2 feet below the surface.

The fact that the water table along the sewer pipe is level is an indication that the pipe leaks. The fact that the water table is so close to the surface along the pipe indicates that water leaks from the pipe to the groundwater and to the surface when the pipe is full, during and after storms. During dry periods migration of water would be more likely to be away from the pipe than toward it. Groundwater may move into the pipe, but this would not be the dominant direction of flow. Under no conditions, according to the 1987 data on water levels, would groundwater flow eastward through the pipe to some point off the Interstate site in measurable quantities.

Since the westward and downward hydraulic gradients can not be explained by the geology and topography of the area, what other explanations are there? The reasonable explanation is groundwater withdrawals from areas to the west and from depths below sea level.

The water supply well on the westerly side of the Interstate site is pumped. It is being pumped at a rate of about 2,800 gallons per day on average. At a minimum, 22 inches of water per year is being recharged on the site. This number is based on an average precipitation of 44 inches per year, of which half does not get into the groundwater because it evaporates. More water than this is recharged on the Interstate site because a large area on site serves as a stormwater storage basin for the surrounding upland areas. With a recharge rate of 22 inches per year, replenishing the water removed from the well without drawing down the water table (except in the immediate vicinity of the well) requires a recharge area of 1.71 acres with a radius of 154 feet. That area is only 20% of the total area of the Interstate site. We conclude that, although pumpage of the Interstate well may have seasonal effects on water levels in nearby monitoring wells, it does not explain the directions of the hydraulic gradients observed.

We conclude that there has been a regional overdrafting of groundwater. This has probably been aggravated by decreasing recharge capability in the region. The consequences of withdrawal of groundwater beyond the renewal capability of the system are the induction of the unstable hydraulic forces which have been observed on the Interstate site, and the slow landward or westerly migration of brackish water into ground which previously stored fresh water.

The pumpage of Interstate's well has not now or for many years had an adverse effect on regional groundwater supplies. Furthermore, its pumpage serves to restrain circulation of groundwater which has passed through contaminated soil to that volume of ground beneath the site itself.

The data are insufficient to describe groundwater flow patterns beneath the site with more detail than has already been given. We do know, however, that the migration of water in the subsurface is very slow. Consequently, the impacts of this migration, if any, are not going to be noticeable for centuries.

9. Migration of Metals in the Subsurface

Because of the chemical nature of the metal elements that are contaminating the upper 6 to 8 feet of soil on the site, the metal ions or compounds that become dissolved in groundwater do not move with the water at its velocity. They tend to move back into the solid phase within short distances. As already discussed, metal migration is severely retarded in comparison to water migration.

This is confirmed by field data. As discussed in the previous section, the column of ground in the area of the cluster of wells, MW-6, MW-7, and MW-8, above the clay layer has probably had water moving through contaminated soil and the rest of the column for the past thirty years. As shown graphically in Figures II(12) through II(15), the soil concentrations of the four elements of concern are all at acceptable levels below 8 feet or less from the surface. We might assume that in 30 years equilibrium conditions have been achieved, and, that with no new additions of contaminants to the soil in the future, the distribution of metal concentrations in the sediments will remain essentially as they now are for the next hundred years. Or, we might assume that they will continue to migrate. In 40 years the contaminants have migrated 8 feet at the maximum. Then in the next hundred years the maximum possible extent of contaminated soil would be to a depth of 20 feet, and the concentrations of contaminants in the solid matrix above 8 feet would be generally lower than at present. It should be emphasized that the dispersion of the contaminants described here only occurs by their solution in the groundwater and then their removal from the aqueous phase to the solid phase elsewhere. Furthermore, the law of mass action tells us that, with the situation as it is at Interstate, elevated concentrations of contaminants in groundwater occur in close proximity to highly elevated concentrations of contaminants in the sediments, that is, in the solid phase.

The estimated horizontal component of the maximum velocity of groundwater (2.73 mm/day) is close to that of the vertical component (3.00 mm/day). If we assume that horizontal migration of the contaminants is similar to the vertical, and that it should be extrapolated linearly into the future, then in 100 years the lateral extent of elevated concentrations of contaminants in soil and water would be about 18 feet beyond its present boundary in the direction of groundwater flow towards the west. Even with this worst case assumption the potential migration of copper, zinc, lead, mercury, or other heavy metals in groundwater from beneath the Interstate site is negligible.

The analyses for the contaminant metals dissolved in ground and surface water at the site essentially confirm our theoretical conclusion that, even in water in direct contact with highly contaminated soil, concentrations of the dissolved contaminants would be low. The maximum concentration found was 2.1 mg/l of zinc in water from MW-4. This is remarkably low.

The ratios of each concentration in water to an average concentration in the sediments with which the water is in contact were calculated, and are shown in Table A-8. The maximum ratio was 27,000,000 to 1. This compares the concentration of zinc in the sediment sample taken from the lagoon at location L-3 to that in water from the same area. Both the aqueous concentrations, and the ratios of concentrations in the solid phase to those in the water phase are quite erratic. For instance, lead was not detected in the soil samples from MW-7 but was detected in the groundwater sample. This gives a ratio of zero. The fact that the distribution pattern of concentration of metal contaminants in water is much more erratic than that in soil is only partially attributable to the fact that far fewer water samples were taken than soil samples. The dominant controlling factor is the complex of chemical, biological, and physical interactions which vary tremendously from point to point in the ground.

Obviously, concentrations of the heavy metal contaminants in the groundwater beneath the Interstate site tend to be higher than they would be in an uncontaminated area with brackish water. However, that is not the issue. Do these low levels of contaminants in groundwater or surface water pose unacceptable ecosystemic risks? This is the issue. We contend that they do not.

The highest concentration of aqueous copper found was 0.51 mg/l. The standard for copper in potable water is 1.0 mg/l, so all 14 samples had copper levels acceptable for drinking. The same was true for zinc and cadmium. Mercury has a very low standard of 0.002 mg/l because it is highly toxic to humans. This value was slightly exceeded in one out of 14 samples. This was in a surface water sample in the pond where wastes from the sewer system are discharged. The chromium results were puzzling.

INTERSTATE METALS SEPARATING CORP.: Table A-8

SOIL VS. WATER CONCENTRATIONS
RATIO OF SOIL CONC. TO WATER CONC.

MAP SITE	SAMPLE ID	Cu	Pb	Hg	Zn	TOTAL
1	MW1		4,062		28,357	16,274
2	MW2	250,545	77,249		55,641	67,542
3	MW3	30,689	113,210		681,793	173,670
4	MW4	50,914	23,212		4,393	6,224
5	MW5	28,844	26,094		53,826	44,772
6	MW6		697		1,120	1,387
7	MW7	307	0		250	243
8	MW8	43,359	110,915		63,805	61,822
L-1	LW-1	150,000	59,072		4,142,857	575,272
L-2	LW-2	224,390	36,184		4,285,714	514,102
L-3	LW-3	146,154	36,879		27,000,000	762,193
P-1	PW-1	13,846	44,118	222,857	141,667	102,175
P-2	PW-2	428,571	407,407	9,500	123,529	231,213
P-3	PW-3	46,512	152,273	34,667	885,714	162,769

These water samples were taken on three different dates and analyzed in three different batches. In the first batch taken on February 5, 1987, all five samples had significant levels of chromium, but in the other two batches no chromium was detected. The levels found in the first batch were above the potable water standard for hexavalent chromium of 0.05 mg/l. However, hexavalent chromium is highly reactive, and, under the environmental conditions found at this site, would not be found in significant proportions in the total chromium concentration. For divalent or monovalent chromium ions, the concentrations of chromium found would be acceptable based on human health criteria. Lead is the only contaminant found in concentrations above its potable water standard of 0.05 mg/l in a significant proportion of the samples (50%). The maximum concentration was six times the standard. However, potable water standards are not appropriate criteria for judging the potential risks from this water, because this water is not potable and would not be potable under natural conditions. This water is brackish!

The issue to address is whether or not lead, at a concentration of 0.3 mg/l or higher, or any of the other contaminants will have significant adverse impacts on the ecosystem in which it is found. We have established that the contaminants of concern will not migrate as solutes in groundwater at elevated concentrations further than a few feet from the contaminated solids from which they originated. Thus, the ecosystem of concern is the Interstate site, and, perhaps, some adjacent land. [This site and adjacent sites are zoned for industrial use. If the surface is covered, as proposed, to protect people, pets, and wildlife, then only microorganisms and a few plants would be at risk.] Industrial use of land usually places microorganisms and plants at risk. We do not perceive any significant adverse impacts on this ecosystem if the remedial action we propose is undertaken.

The Water Pollution Control Act of the State of New Jersey states:

> It is the policy of this State to restore, enhance and maintain the chemical, physical, and biological integrity of its waters, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial and other uses of water.

How should this policy be interpreted given the very limited migration of the heavy metal elements of concern in the subsurface?

C. PROPOSAL FOR FURTHER INVESTIGATION

1. Measurement of Surface Water Elevations

Determining the water elevations of the lagoon, the large pond, and the small pond at the same time as water levels in the monitoring wells would provide very valuable additional information about groundwater hydraulic gradients and flow directions. We shall have devices installed so that these measurements can be made. We propose to take water level measurements at least two more times about a month apart.

2. Resampling and Chemical Analysis of Surface and Ground Water

*

The results from one set of samples of water from monitoring wells and surface water, which were taken on three different days, are not sufficient to determine variability, nor to assess the meaning of anomalous results. We propose to take two more rounds of water samples about a month apart. In addition to the eight samples from monitoring wells, three from the lagoon, and three from the pond, we propose to take one sample from the water supply well, and two from the small pond. Parameters to be measured shall include pH, specific conductivity, priority pollutant metals, sodium, and chloride. The samples for metals will be filtered and acidified in the field. We would be willing to discuss with representaives of the Department of Environmental Protection the possibility of adding other parameters to the list.

II. ENVIRONMENTAL CONDITIONS OFF-SITE

There are several indications that some soil on the sites owned by the railroad (Block 275, and Block 253 or 252, Lot 5), and the property to the north of Interstate (Block 252, Lot 4B) may be contaminated. Boring D on Figure II(1) was made very close to the property line between the Interstate site and Block 252, Lot 4B. Soil samples from that boring show that there is contamination down to at least 4 feet deep. Other borings and monitoring wells near property lines also show elevated levels of the elements of concern. Furthermore, some of the off-site vegetation is depauperate.

We agree that further study is needed. Studying the character of the vegetation would give a rough estimate of the possible extent of off-site contamination. We suggest that discussion between representatives of the Department and ourselves on the following topics would be an appropriate way to proceed:

Purpose of study;
Method of study;
Persons responsible for bearing costs of study;
Persons responsible for conducting study;
Provision for providing access to all sites involved in study; - including the Bergen Ave Site
Protection of participants from possible legal actions.

III. ENVIRONMENTAL IMPACTS OF STORMWATER SEWER SYSTEM

There have been numerous environmental effects on the Interstate site from stormwater and sanitary sewage that have entered the site via the stormwater sewers in the ground at the site. Some of these have been discussed in this report and the earlier report. We are willing to discuss these observations with whomever is concerned about the environmental impacts of the system. The Town of Kearny and the Passaic Valley Sewerage Commissioners are responsible for the sewer system. Conrail is also involved. Further discussion should involve these parties. Further study might be the responsibility of the municipality. The involvement of Interstate in any future study should be negotiated with the company, and with us as its representatives.

IV. ENVIRONMENTAL IMPACTS OF RECIRCULATING LAGOON

The question has arisen as to whether or not the lagoon on the Interstate site requires a New Jersey Pollutant Discharge Elimination System (NJPDES) permit. The lagoon is used as a storage basin for water used in the brass separation process. After solid particles have settled out of the water in a settling basin lined with concrete, the supernatant water is drained into the lagoon. Then water is pumped from the lagoon back to the start of the brass separation process.

The water, from the time it leaves the settling basin until it leaves the settling basin again, is saturated with dissolved species of the metallic elements of concern -- zinc and copper. It is also saturated with suspended colloidal particles. The concentrations of the dissolved and colloidal species are virtually constant as the water is recirculated time after time. As water evaporates from the water in circulation, new water from the well is added. The concentration still does not change. The rate of precipitation or settlement in the lagoon is equaled by the rate of resuspension of material in the water. It is a system in chemical equilibrium.

It is also a system in physical equilibrium. The lagoon is cut into the groundwater-bearing sediments on the site. The hydraulic pressure which might move water-borne pollutants into the groundwater is equal and opposite to the hydraulic pressure of the groundwater trying to get into the lagoon. The effective result is that groundwater does not move into the lagoon, and that lagoon water does not move into the groundwater.

In our view this situation does not constitute a "discharge". According to the New Jersey Water Pollution Control Act:

> "Discharge" means the releasing, spilling, leaking, pumping, pouring, emitting, emptying, or dumping of a pollutant into the waters of the State or onto land or into wells from which it might flow or drain into said waters, ... (58:10A-3.e.)
>
> "Pollutant" means any dredged spoil, solid waste, incinerator residue, sewage, garbage, refuse oil, grease, sewage sludge, munitions, chemical wastes, biological materials, radioactive substance, thermal waste, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal or agricultural waste or other residue discharged into the waters of the State. (58:10A-3.n.)
>
> "Waters of the State" means the ocean and its estuaries, all springs, streams and bodies of surface or ground water, whether natural or artificial, within the boundaries of this State or subject to its jurisdiction. (58:10A-3.t.)
>
> It shall be unlawful for any person to discharge any pollutant, except in conformity with a valid New Jersey Pollutant Discharge Elimination System permit ... (58:10A-6.a.)

There is no real discharge, since there is nothing happening that changes water quality. Therefore, technically, we feel that there is no discharge taking place.

AOM-012

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO File Through T. Cavalier

FROM Kevin Krause KK

DATE 9/20/85

SUBJECT Interstate Metals Separating Corp., 275 Dutes Street, Kearny

BACKGROUND:

At the request of the Kearny Health Dept., a meeting was held on 9-19-85 to discuss mercury contamination at the above mentioned site. Representatives from Kearny Health as well as Hudson Regional Health were present. At approximately 1045 Hrs, T. Cavalier and myself proceeded to the site. We spole with Barry Brown the owner of Interstate Metals Separating Corp., Mr. Brown was very disturbed that we had not called earlier to announce our inspection.

INVESTIGATION:

During the course of our questioning, the following information was obtained from Mr. Brown.

1) IMSC has been at this site since 1945. Prior to 1945, Johnson File Co. was at this site.
2) IMSC did in fact "sun mercury during the 1950-1960's (1967). The mercury contamination on site is the result of spills according to Mr. Brown.
3) IMSC has a well used to withdraw 200 gal./hr of cooling water from the aquifer. The well is 371' deep and has not been sampled recently to the best of Brown's knowledge.
4) A disgruntled employee may have purposely left contaminates during a previous clean up. Employee was in charge of supervising the clean up. Exact locations of "remaining" contamination were given by informant to DEP (Brady & Howitz) according Brown.
5) Site She is owned by IMSC. Possible sale in future is anticipated Mr. Brown is willing to clean up site now, as long as clean up will assist in an ECRA approval of sale at later date.
6) Consultant for IMSC is Max Frenkel, 609-779-8112 of total Environmental Services.

OBSERVATIONS:

Outside of the fenced area (land still owned by IMSC) scoops of soil from various pts (surface only) in the area were obtained and denoted cs sample kk050. Time of sample was=1120 Hrs. Sample was taken by the writer. Many of the scoops of soil were taken where dirt bike tracks were observed. At one location a scoop at a chromium salt like material (yellowish-green solid) was included in this sample.

Inside the fenced area, I took a composite sample from 2 areas which are known to have mercury contamination and 2 areas adjacent to the building in which the mercury was recovered. In a drainage through inside the mercury building, several scoops of soil were taken (=16" deep) in which liquid mercury was observed. A scope of bottom sludge from the colling water discharge through immediately, outside the mercury building was included in this sample. This sample was obtained at approximately 1155 HRS. and is designated as DEP sample# kk051. Sample was collected by the writer.

RECOMMENDATIONS:

The investigative phase should include the following elements:

1) A soil sampling plan should be developed and submitted to DEP with 30 days.

2) The water well at IMSC should be immediately sampled and analyzed for priority pollutant plus forty parameters. Surface water in the unsecured area should also be sampled and analyzed in the same manner.

3) Measures to restrict access to the unsecured site should be required.

4) All sample results should be forward to DWM-BFO.

KK/cr

CHAIN OF CUSTODY

Company: NJDEP Job No.

Address

Attention:

Sample Description: Rec'd 2 samples directly from client. Non-ETC bottles

CUSTOMER ID	DESCRIPTION	ETC #
KK050 9-19-85 11:20 Composites	1 - 1 liter amber bottle (soil)	
KK051 9-19-85 11:55 Composite	1 - 1 liter amber bottle. (soil)	

Sample(s) Relinquished by: Kevin K. Krause

Time: 1130 Date: 9-20-85

Sample(s) Received by: M. Ichstadt

Time: 11:30 Date: 9-20-85

Form DWM-022
10/82

NEW J... DEPARTMENT OF ENVIRONMENTAL ...CTION
DIVISION OF WASTE MANAGEMENT
BUREAU OF FIELD OPERATIONS

NO. ______

FIELD SAMPLING DATA SHEET

DATE 9/19/85 HW/EF # 85 - 09 19 02M

E.P.A. ID # NONE

CASE NAME Interstate Metal Separating Co.

LOCATION Dukes St.
Kearny

CONTACT: Barry Brown

TIME OF SAMPLING 1120 HOURS

COLLECTED BY: Kevin Krause

RECORDED BY: Kevin Krause

FIELD SAMPLE NO. A KK050

B ______

SPECIFIC SAMPLING SITE:

- ☐ DRUM # ______
- ☐ TANK TRAILER # ______
- ☐ STATIONARY TANK # ______
- ☐ HORIZONTAL ☐ VERTICAL ☐ UNDERGROUND
- ☐ TOP ☐ MIDDLE ☐ BOTTOM
- ☒ OTHER misc. sites at perimeter of fenced area

SAMPLING CONTAINER:

- ☒ GLASS ☐ PLASTIC
- ☐ OTHER ______

CONTAINER VOLUME:

- ☐ PINT ☐ QUART
- ☒ OTHER ______ OZ./ 950 ML.

CONTAINER FILLED: ☒ YES ☐ NO

CHAIN OF CUSTODY INITIATED

☒ YES ☐ NO

TYPE OF SAMPLE:

- ☐ LIQUID ☐ SLUDGE
- ☐ SOLID ☒ SOIL
- ☐ OTHER ______

CHARACTERISTICS OF SAMPLE:

- ☐ TURBID ☐ TRANSPARENT
- COLOR brown
- ODOR None
- OTHER ______

SUSPECTED SUBSTANCE(S):

ADDITIONAL INFORMATION:

C-4

Form DWM-022
10/82

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
BUREAU OF FIELD OPERATIONS

NO. ______

FIELD SAMPLING DATA SHEET

DATE 9/19/85 HW/EF # 85 - 09 19 02M

E.P.A. ID # NONE

CASE NAME IMSC

TIME OF SAMPLING 1155 HOURS

LOCATION Dukes Street
Kearny

COLLECTED BY: Kevin Krause

RECORDED BY: Kevin Krause

CONTACT: Barry Brown

FIELD SAMPLE NO. A KK051

B ______

SPECIFIC SAMPLING SITE:

- [ ] DRUM # ______
- [ ] TANK TRAILER # ______
- [ ] STATIONARY TANK # ______
- [ ] HORIZONTAL [ ] VERTICAL [ ] UNDERGROUND
- [ ] TOP [ ] MIDDLE [ ] BOTTOM
- [x] OTHER inside mercury building

SAMPLING CONTAINER:

- [x] GLASS [ ] PLASTIC
- [ ] OTHER ______

CONTAINER VOLUME:

- [ ] PINT [ ] QUART
- [x] OTHER ______ OZ./ 950 ML.

CONTAINER FILLED: [x] YES [ ] NO

CHAIN OF CUSTODY INITIATED

[x] YES [ ] NO

TYPE OF SAMPLE:

- [ ] LIQUID [ ] SLUDGE
- [ ] SOLID [x] SOIL
- [ ] OTHER ______

CHARACTERISTICS OF SAMPLE:

- [ ] TURBID [ ] TRANSPARENT

COLOR brown

ODOR None

OTHER ______

SUSPECTED SUBSTANCE(S):

ADDITIONAL INFORMATION:

C-5

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 12, 1985

TA... ...ITATIVE RESULTS and QUALITY ASSURANCE DATA

Metals, Cyanide and Phenols - Analysis Data (QR05)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1166	NJ DEP	NJDINTERMT	KK050	850920		

NPDES Number	Compound		Results: Sample Concen.	Results: MDL
1M	Antimony	ug/kg	110000	6000
2M	Arsenic	mg/kg	13	1.0
3M	Beryllium	ug/kg	21600	50
4M	Cadmium	ug/kg	64000	300
5M	Chromium	ug/kg	249000	1000
6M	Copper	ug/kg	70800000	600
7M	Lead	mg/kg	12300000	6000
8M	Mercury	mg/kg	40000	1000
9M	Nickel	ug/kg	1370000	1000
10M	Selenium	mg/kg	30	.5
11M	Silver	ug/kg	301000	1000
12M	Thallium	mg/kg	.5	.5
13M	Zinc	ug/kg	ND	3000
14M	Cyanide, Total	mg/kg	<.5	.5
15M	Phenolics, Total	mg/kg	.4	.1

016

C-6

K-1

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 1, 1985

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Aroclors – GC Analysis Data (QR14)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1166	NJ DEP	NJDINTERMT	KK050	850920		

Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
	Sample Concen. ug/kg	MDL ug/kg a	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov b	Unspiked Sample ug/kg	Concen. Added ug/kg	% Reco
Aroclor 1242	ND	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1254	2900 c	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1260	ND	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1248	ND	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1232	ND	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1221	ND	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1016	ND	1300	ND	ND	ND	0	-	ND	0	-

a ETC established Method Detection Limit for this particular sample.

b Reagent Blank. Spiked Blank cannot be performed for this sample matrix.

c Confirmed by second column.

NOV 1, 1985

008

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Pesticide Compounds – GC Analysis Data (QR32)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1166	NJ DEP	NJDINTERMT	KK050	850920		

NPDES Number	Compound	Results: Sample Concen. ug/kg	Results: MDL ug/kg [a]	QC Replicate: First ug/kg	QC Replicate: Second ug/kg	QC Blank and Spiked Blank: Blank Data ug/kg	QC Blank and Spiked Blank: Concen. Added ug/kg	QC Blank and Spiked Blank: % Recov [b]	QC Matrix Spike: Unspiked Sample ug/kg	QC Matrix Spike: Concen. Added ug/kg	QC Matrix Spike: % Recov
1P	Aldrin	ND	13	ND	ND	ND	0	-	ND	100	150 [c]
2P	Alpha-BHC	ND	13	ND	ND	ND	0	-	ND	100	0 [c]
3P	Beta-BHC	ND	13	ND	ND	ND	0	-	ND	100	110
4P	Gamma-BHC	ND	13	ND	ND	ND	0	-	ND	100	130
5P	Delta-BHC	ND	13	ND	ND	ND	0	-	ND	100	110
6P	Chlordane	ND	1300	ND	ND	ND	0	-	ND	100	-
7P	4,4'-DDT	ND	13	ND	ND	ND	0	-	ND	100	92
8P	4,4'-DDE	ND	13	ND	ND	ND	0	-	ND	100	89
9P	4,4'-DDD	ND	13	ND	ND	ND	0	-	ND	100	69
10P	Dieldrin	ND	13	ND	ND	ND	0	-	ND	100	90
11P	Endosulfan I	ND	13	ND	ND	ND	0	-	ND	100	110
12P	Endosulfan II	ND	13	ND	ND	ND	0	-	ND	100	61
13P	Endosulfan sulfate	ND	13	ND	ND	ND	0	-	ND	100	95
14P	Endrin	ND	13	ND	ND	ND	0	-	ND	100	130
15P	Endrin aldehyde	ND	13	ND	ND	ND	0	-	ND	100	37
16P	Heptachlor	ND	13	ND	ND	ND	0	-	ND	100	110
17P	Heptachlor epoxide	ND	13	ND	ND	ND	0	-	ND	100	120
25P	Toxaphene	ND	1300	ND	ND	ND	0	-	ND	0	-

a ETC established Method Detection Limit for this particular sample.

b Reagent Blank. Spiked Blank cannot be performed for this sample matrix.

c Recovery variable due to sample matrix interference.

C-8

K.3

007

ETC ENVIRONMENTAL TESTING and CERTIFICATION

OCT 30, 1985

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

BASE/NEUTRAL COMPOUNDS – GC/MS ANALYSIS DATA (QR03)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1166	NJ DEP	NJDINTERMT	KK050	850920		

C-9

NPDES Number	Compound	Results: Sample Concen. ug/kg	Results: MDL ug/kg[a]	QC Replicate: First ug/kg	QC Replicate: Second ug/kg	QC Blank and Spiked Blank: Blank Data ug/kg	QC Blank and Spiked Blank: Concen Added ug/kg	QC Blank and Spiked Blank: % Recov[b]	QC Matrix Spike: Unspiked Sample ug/kg	QC Matrix Spike: Concen. Added ug/kg	QC Matrix Spike: % Recov
33B	Hexachlorobenzene	989	130	ND	ND	ND	0	-	ND	7570	30
34B	Hexachlorobutadiene	ND	63	ND	ND	ND	0	-	ND	7570	38
35B	Hexachlorocyclopentadiene	ND	690	ND	ND	ND	0	-	ND	0	-
36B	Hexachloroethane	1200	110	ND	ND	ND	0	-	ND	7570	36
37B	Indeno(1,2,3-c,d)pyrene	ND	330	ND	ND	ND	0	-	ND	0	-
38B	Isophorone	ND	150	ND	ND	ND	0	-	ND	7570	42
39B	Naphthalene	ND	110	ND	ND	ND	0	-	ND	7570	41
40B	Nitrobenzene	ND	130	ND	ND	ND	0	-	ND	7570	39
41B	N-Nitrosodimethylamine	ND	690	ND	ND	ND	0	-	ND	0	-
42B	N-Nitrosodi-n-propylamine	ND	690	ND	ND	ND	0	-	ND	7570	43
43B	N-Nitrosodiphenylamine	ND	130	ND	ND	ND	0	-	ND	7570	47
44B	Phenanthrene	941	380	ND	ND	ND	0	-	ND	7570	36
45B	Pyrene	1400	130	ND	ND	ND	0	-	ND	7570	42
46B	1,2,4-Trichlorobenzene	ND	130	ND	ND	ND	0	-	ND	7570	39

a ETC established Method Detection Limit for this particular sample.

b Reagent Blank. Spiked Blank cannot be performed for this sample matrix.

c Recoveries normally low and variable using EPA Protocol Method 625.

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

OCT 30, 1985

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

BASE/NEUTRAL COMPOUNDS - GC/MS ANALYSIS DATA (QR03)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1166	NJ DEP	NJDINTERMT	KK050	850920		

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006

NPDES Number	Compound	Results: Sample Concen. ug/kg	Results: MDL ug/kg	QC Replicate: First ug/kg	QC Replicate: Second ug/kg	QC Blank and Spiked Blank: Blank Data ug/kg	QC Blank and Spiked Blank: Concen. Added ug/kg	QC Blank and Spiked Blank: % Recov s	QC Matrix Spike: Unspiked Sample ug/kg	QC Matrix Spike: Concen. Added ug/kg	QC Matrix Spike: % Recov
1B	Acenaphthene	ND	130	ND	ND	ND	0	-	ND	7570	44
2B	Acenaphthylene	ND	240	ND	ND	ND	0	-	ND	7570	44
3B	Anthracene	ND	130	ND	ND	ND	0	-	ND	7570	43
4B	Benzidine	ND	3100	ND	ND	ND	0	-	ND	7570	0
5B	Benzo(a)anthracene	ND	540	ND	ND	ND	0	-	ND	7570	30
6B	Benzo(a)pyrene	223	170	ND	ND	ND	0	-	ND	7570	35
7B	Benzo(b)fluoroanthene	674	330	ND	ND	ND	0	-	ND	7570	38
8B	Benzo(ghi)perylene	ND	280	ND	ND	ND	0	-	ND	0	-
9B	Benzo(k)fluoranthene	ND	240	ND	ND	ND	0	-	ND	7570	39
10B	bis(2-Chloroethoxy)methane	ND	370	ND	ND	ND	0	-	ND	7570	40
11B	bis(2-Chloroethyl) ether	ND	400	ND	ND	ND	0	-	ND	7570	40
12B	bis(2-Chloroisopropyl)ether	ND	400	ND	ND	ND	0	-	ND	7570	56
13B	bis(2-Ethylhexyl)phthalate	ND	690	ND	ND	ND	0	-	ND	7570	45
14B	4-Bromophenyl phenyl ether	ND	130	ND	ND	ND	0	-	ND	7570	37
15B	Butyl benzyl phthalate	ND	690	ND	ND	ND	0	-	ND	7570	[illegible]
16B	2-Chloronaphthalene	ND	130	ND	ND	ND	0	-	ND	7570	[illegible]
17B	4-Chlorophenyl phenyl ether	ND	290	ND	ND	ND	0	-	ND	7570	[illegible]
18B	Chrysene	ND	170	ND	ND	ND	0	-	ND	7570	43
19B	Dibenzo(a,h)anthracene	ND	690	ND	ND	ND	0	-	ND	0	-
20B	1,2-Dichlorobenzene	ND	130	ND	ND	ND	0	-	ND	7570	38
21B	1,3-Dichlorobenzene	ND	130	ND	ND	ND	0	-	ND	7570	35
22B	1,4-Dichlorobenzene	ND	310	ND	ND	ND	0	-	ND	7570	36
23B	3,3'-Dichlorobenzidine	ND	1180	ND	ND	ND	0	-	ND	7570	23
24B	Diethyl phthalate	ND	690	ND	ND	ND	0	-	ND	7570	44
25B	Dimethyl phthalate	ND	690	ND	ND	ND	0	-	ND	7570	41
26B	Di-n-butyl phthalate	ND	690	ND	ND	ND	0	-	ND	7570	79
27B	2,4-Dinitrotoluene	ND	400	ND	ND	ND	0	-	ND	7570	44
28B	2,6-Dinitrotoluene	ND	130	ND	ND	ND	0	-	ND	7570	47
29B	Di-n-octyl phthalate	ND	690	ND	ND	ND	0	-	ND	7570	40
30B	1,2-Diphenylhydrazine	ND	690	ND	ND	ND	0	-	ND	7570	42
31B	Fluoranthene	1590	150	ND	ND	ND	0	-	ND	7570	42
32B	Fluorene	ND	130	ND	ND	ND	0	-	ND	7570	42

ETC ENVIRONMENTAL TESTING and CERTIFICATION

ETC TESTING and CERTIFICATION

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Metals, Cyanide and Phenols Analysis Data

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1167	NJ DEP	NJDINTERMT	KK05I	850920		

NPDES Number	Compound		Results: Sample Concen.	Results: MDL
	Antimony	ug/kg	380000	6000
	Arsenic	mg/kg	ND	2.0
3M	Beryllium	ug/kg	32300	50
4M	Cadmium	ug/kg	73300	300
5M	Chromium	ug/kg	915000	1000
6M	Copper	ug/kg	49100000	600
7M	Lead	ug/kg	15900000	6000
8M	Mercury	mg/kg	220	10
9M	Nickel	ug/kg	1880000	500
10M	Selenium	mg/kg	2	.5
11M	Silver	ug/kg	8000	1000
12M	Thallium	mg/kg	BMDL	.5
13M	Zinc	ug/kg	ND	3000
14M	Cyanide, Total	mg/kg	1.0	.5
15M	Phenolics, Total	mg/kg	.8	.1

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 1, 1985

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Aroclors - GC Analysis Data (QR14)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1167	NJ DEP	NJDINTERMT	KK051	850920		

Compound	Results: Sample Concen. ug/kg	Results: MDL ug/kg a	QC Replicate: First ug/kg	QC Replicate: Second ug/kg	QC Blank and Spiked Blank: Blank Data ug/kg	QC Blank and Spiked Blank: Concen. Added ug/kg	QC Blank and Spiked Blank: % Recov b	QC Matrix Spike: Unspiked Sample ug/kg	QC Matrix Spike: Concen. Added ug/kg	QC Matrix Spike: % Recov b
Aroclor 1242	ND	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1254	BMDL c	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1260	ND	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1248	ND	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1232	ND	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1221	ND	1300	ND	ND	ND	0	-	ND	0	-
Aroclor 1016	ND	1300	ND	ND	ND	0	-	ND	0	-

a ETC established Method Detection Limit for this particular sample.

b Reagent Blank. Spiked Blank cannot be performed for this sample matrix.

c Confirmed by second column.

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ETC

NOV 30 1985

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 1, 1985

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Pesticide Compounds – GC Analysis Data (QR32)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1167	NJ DEP	NJDINTERMT	KK051	850920		

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spik		
		Sample Concen. ug/kg	MDL ug/kg a	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov b	Unspiked Sample ug/kg	Concen. Added ug/kg	% Recov
1P	Aldrin	ND	13	ND	ND	ND	0	-	ND	100	150c
2P	Alpha-BHC	ND	13	ND	ND	ND	0	-	ND	100	0c
3P	Beta-BHC	ND	13	ND	ND	ND	0	-	ND	100	110
4P	Gamma-BHC	ND	13	ND	ND	ND	0	-	ND	100	130
5P	Delta-BHC	ND	13	ND	ND	ND	0	-	ND	100	110
6P	Chlordane	ND	13	ND	ND	ND	0	-	ND	100	-
7P	4,4'-DDT	ND	1300	ND	ND	ND	0	-	ND	100	92
8P	4,4'-DDE	ND	13	ND	ND	ND	0	-	ND	100	89
9P	4,4'-DDD	ND	13	ND	ND	ND	0	-	ND	100	69
10P	Dieldrin	ND	13	ND	ND	ND	0	-	ND	100	90
11P	Endosulfan I	ND	13	ND	ND	ND	0	-	ND	100	110
12P	Endosulfan II	ND	13	ND	ND	ND	0	-	ND	100	61
13P	Endosulfan sulfate	ND	13	ND	ND	ND	0	-	ND	100	95
14P	Endrin	ND	13	ND	ND	ND	0	-	ND	100	130
15P	Endrin aldehyde	ND	13	ND	ND	ND	0	-	ND	100	37
16P	Heptachlor	ND	13	ND	ND	ND	0	-	ND	100	[illegible]
17P	Heptachlor epoxide	230	13	ND	ND	ND	0	-	ND	100	[illegible]
25P	Toxaphene	ND	1300	ND	ND	ND	0	-	ND	0	-

a ETC established Method Detection Limit for this particular sample.
b Reagent Blank. Spiked Blank cannot be performed for this sample [illegible]
c Recovery variable due to sample matrix interference.
d Confirmed by second column.

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K.8

ETC ENVIRONMENTAL TESTING and CERTIFICATION

OCT 30, 1985

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Volatile Compounds - GC/MS Analysis Data (QR01)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1167	NJ DEP	NJDINTERMT	KK051	850920		

NPDES Number	Compound (Acrolein and Acrylonitrile values are screen only.)	Results: Sample Concen. ug/kg	Results: MDL ug/kg*	QC Replicate: First ug/kg	QC Replicate: Second ug/kg	QC Blank and Spiked Blank: Blank Data ug/kg	QC Blank and Spiked Blank: Concen. Added ug/kg	QC Blank and Spiked Blank: % Recov	QC Matrix Spike: Unspiked Sample ug/kg	QC Matrix Spike: Concen. Added ug/kg	QC Matrix Spike: Recov #
1V	Acrolein	ND	100	ND	ND	ND	800	102	31000	800	0
2V	Acrylonitrile	ND	100	ND	ND	ND	80.0	90	696	80.0	68
3V	Benzene	ND	4.4	ND	ND	ND	18.0	102	ND	18.0	137
4V	bis(Chloromethyl)ether	ND	10	ND	ND	ND	0	-	ND	0	-
5V	Bromoform	ND	4.7	ND	ND	ND	18.0	88	ND	18.0	75
6V	Carbon tetrachloride	ND	2.8	ND	ND	ND	18.0	97	ND	18.0	147
7V	Chlorobenzene	ND	6.0	ND	ND	ND	18.0	101	ND	18.0	131
8V	Chlorodibromomethane	ND	3.1	ND	ND	ND	18.0	94	ND	18.0	86
9V	Chloroethane	ND	10	ND	ND	ND	18.0	101	ND	18.0	141
10V	2-Chloroethylvinyl ether	ND	10	ND	ND	ND	18.0	135	ND	18.0	124
11V	Chloroform	2.74	1.6	ND	ND	ND	18.0	100	ND	18.0	134
12V	Dichlorobromomethane	ND	2.2	ND	ND	ND	18.0	95	ND	18.0	111
13V	Dichlorodifluoromethane	ND	10	ND	ND	ND	18.0	108	ND	18.0	158
14V	1,1-Dichloroethane	ND	4.7	ND	ND	ND	18.0	100	ND	18.0	139
15V	1,2-Dichloroethane	ND	2.8	ND	ND	ND	18.0	98	ND	18.0	98
16V	1,1-Dichloroethylene	ND	2.8	ND	ND	ND	18.0	100	ND	18.0	150
17V	1,2-Dichloropropane	ND	6.0	ND	ND	ND	18.0	101	ND	18.0	121
18V	cis-1,3-Dichloropropylene	ND	5.0	ND	ND	ND	18.0	92	ND	18.0	
19V	Ethylbenzene	ND	7.2	ND	ND	ND	18.0	101	ND	18.0	[illegible]
20V	Methyl bromide	ND	10	ND	ND	ND	18.0	91	ND	18.0	1[illegible]
21V	Methyl chloride	ND	10	ND	ND	ND	18.0	107	ND	18.0	138
22V	Methylene chloride	79.2	2.8	15.3	6.88	17.5	18.0	43	88.2	18.0	0
23V	1,1,2,2-Tetrachloroethane	ND	6.9	ND	ND	ND	18.0	106	20.2	18.0	8
24V	Tetrachloroethylene	BMDL	4.1	ND	ND	ND	18.0	105	ND	18.0	151
25V	Toluene	ND	6.0	ND	ND	ND	18.0	104	ND	18.0	143
26V	1,2-Trans-dichloroethylene	ND	1.6	ND	ND	ND	18.0	99	ND	18.0	144
27V	1,1,1-Trichloroethane	ND	3.8	ND	ND	ND	18.0	100	ND	18.0	151
28V	1,1,2-Trichloroethane	ND	5.0	ND	ND	ND	18.0	102	ND	18.0	92
29V	Trichloroethylene	3.99	1.9	ND	ND	ND	18.0	97	ND	18.0	137
30V	Trichlorofluoromethane	ND	10	ND	ND	ND	18.0	102	ND	18.0	156
31V	Vinyl chloride	ND	10	ND	ND	ND	18.0	105	ND	18.0	157
18V	trans-1,3-Dichloropropylene	ND	10	ND	ND	ND	18.0	93	ND	18.0	103

* EPA published Method Detection Limit.

\# Recovery variable due to sample matrix interference.

Relative Percent Difference (RPD) for VOA

ETC ENVIRONMENTAL TESTING and CERTIFICATION

OCT 30, 1985

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

BASE/NEUTRAL COMPOUNDS - GC/MS ANALYSIS DATA (QR03)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1167	NJ DEP	NJDINTERMT	KK051	850920		

NPDES Number	Compound	Results: Sample Concen. ug/kg	Results: MDL ug/kg	QC Replicate: First ug/kg	QC Replicate: Second ug/kg	QC Blank and Spiked Blank: Blank Data ug/kg	QC Blank and Spiked Blank: Concen. Added ug/kg	QC Blank and Spiked Blank: % Recov	QC Matrix Spike: Unspiked Sample ug/kg	QC Matrix Spike: Concen. Added ug/kg	QC Matrix Spike: % Recov
1B	Acenaphthene	ND	120	ND	ND	ND	0	-	ND	7570	44
2B	Acenaphthylene	ND	220	ND	ND	ND	0	-	ND	7570	44
3B	Anthracene	3000	120	ND	ND	ND	0	-	ND	7570	43
4B	Benzidine	ND	2800	ND	ND	ND	0	-	ND	7570	0
5B	Benzo(a)anthracene	665	490	ND	ND	ND	0	-	ND	7570	30
6B	Benzo(a)pyrene	ND	160	ND	ND	ND	0	-	ND	7570	35
7B	Benzo(b)fluoroanthene	1200	300	ND	ND	ND	0	-	ND	7570	38
8B	Benzo(ghi)perylene	ND	260	ND	ND	ND	0	-	ND	0	-
9B	Benzo(k)fluoranthene	512	220	ND	ND	ND	0	-	ND	7570	39
10B	bis(2-Chloroethoxy)methane	ND	330	ND	ND	ND	0	-	ND	7570	40
11B	bis(2-Chloroethyl) ether	ND	360	ND	ND	ND	0	-	ND	7570	40
12B	bis(2-Chloroisopropyl)ether	ND	360	ND	ND	ND	0	-	ND	7570	56
13B	bis(2-Ethylhexyl)phthalate	ND	630	ND	ND	ND	0	-	ND	7570	45
14B	4-Bromophenyl phenyl ether	ND	120	ND	ND	ND	0	-	ND	7570	37
15B	Butyl benzyl phthalate	ND	630	ND	ND	ND	0	-	ND	7570	42
16B	2-Chloronaphthalene	ND	120	ND	ND	ND	0	-	ND	7570	40
17B	4-Chlorophenyl phenyl ether	ND	260	ND	ND	ND	0	-	ND	7570	[illegible]
18B	Chrysene	1130	160	ND	ND	ND	0	-	ND	7570	[illegible]
19B	Dibenzo(a,h)anthracene	ND	630	ND	ND	ND	0	-	ND	0	-
20B	1,2-Dichlorobenzene	ND	120	ND	ND	ND	0	-	ND	7570	38
21B	1,3-Dichlorobenzene	ND	120	ND	ND	ND	0	-	ND	7570	35
22B	1,4-Dichlorobenzene	ND	280	ND	ND	ND	0	-	ND	7570	36
23B	3,3'-Dichlorobenzidine	ND	1000	ND	ND	ND	0	-	ND	7570	23
24B	Diethyl phthalate	ND	630	ND	ND	ND	0	-	ND	7570	44
25B	Dimethyl phthalate	ND	630	ND	ND	ND	0	-	ND	7570	41
26B	Di-n-butyl phthalate	ND	630	ND	ND	ND	0	-	ND	7570	79
27B	2,4-Dinitrotoluene	ND	360	ND	ND	ND	0	-	ND	7570	44
28B	2,6-Dinitrotoluene	ND	120	ND	ND	ND	0	-	ND	7570	47
29B	Di-n-octyl phthalate	ND	630	ND	ND	ND	0	-	ND	7570	40
30B	1,2-Diphenylhydrazine	ND	630	ND	ND	ND	0	-	ND	7570	42
31B	Fluoranthene	2880	140	ND	ND	ND	0	-	ND	7570	42
32B	Fluorene	ND	120	ND	ND	ND	0	-	ND	7570	42

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ETC ENVIRONMENTAL

ETC ENVIRONMENTAL TESTING and CERTIFICATION

OCT 30, 1985

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Acid Compounds - GC/MS Analysis Data (QR02)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
K1167	NJ DEP	NJDINTERMT	KK051	850920		

DES Number	Compound	Results: Sample Concen. ug/kg	Results: MDL ug/kg*	QC Replicate: First ug/kg	QC Replicate: Second ug/kg	QC Blank and Spiked Blank: Blank Data ug/kg	QC Blank and Spiked Blank: Concen. Added ug/kg	QC Blank and Spiked Blank: % Recov #	QC Matrix Spike: Unspiked Sample ug/kg	QC Matrix Spike: Concen. Added ug/kg	QC Matrix Spike: % Recov
1A	2-Chlorophenol	ND	210	ND	ND	ND	0	-	ND	7570	45
2A	2,4-Dichlorophenol	ND	170	ND	ND	ND	0	-	ND	7570	42
3A	2,4-Dimethylphenol	ND	170	ND	ND	ND	0	-	ND	7570	40
4A	4,6-Dinitro-o-cresol	ND	1500	ND	ND	ND	0	-	ND	7570	26
5A	2,4-Dinitrophenol	ND	2600	ND	ND	ND	0	-	ND	7570	23
6A	2-Nitrophenol	ND	230	ND	ND	ND	0	-	ND	7570	35
7A	4-Nitrophenol	ND	150	ND	ND	ND	0	-	ND	7570	40
8A	p-Chloro-m-cresol	ND	190	ND	ND	ND	0	-	ND	7570	41
9A	Pentachlorophenol	ND	230	ND	ND	ND	0	-	ND	7570	32
10A	Phenol	ND	94	ND	ND	ND	0		ND	7570	42
11A	2,4,6-Trichlorophenol	ND	170	ND	ND	ND	0		ND	7570	39

* ETC established Method Dete[illegible] Limit for this particular sample.

\# Percent Recov. Spiked Blank cannot be performed for this sample [illegible].

C-16

K-7

Let's protect our earth

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT
John J. Trela, Ph.D., Acting Director
2 Babcock Place
West Orange, N.J. 07052
201 - 669 - 3960

April 27, 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P-552 069 096

Mr. Dennis Krumholz
Riker, Danzig, Scherer, Hyland
& Perretti
Headquarters Plaza
One Speedwell Avenue
CN 1981
Morristown, NJ 07960-1981

Re: Interstate Metals Separating Corporation

Dear Mr. Krumholz:

This letter serves as a response to the correspondence from Ann L. Kruger of J.H. Crow Company dated April 20, 1988. This office has been and will continue to be cooperative in working with all representatives of Interstate Metals Separating Corporation. Discussions related to the recently submitted report, dated March 15, 1988 can be conducted over the phone. These discussions can be conducted with Ted Hayes of the New Jersey Geological Survey or with representatives from this office. I think you would agree that discussions of this kind can be beneficial to all parties involved.

It should be noted that the supplemental report did not sufficiently address the two areas that will have a direct impact on the course of future site remediation. These areas are the proper classification of the contamination and the investigation for contamination on the properties adjacent to the Interstate Metals site.

As was indicated in my letter of February 4, 1988 the metals contamination found at the site must be analyzed for the characteristic of EP Toxicity. This method of analysis will determine whether or not the contamination is a hazardous waste.

4. Article Number
P-552 069 096
Type of Service:
Registered
Certified
Insured
COD
Hyland

If the site exhibits the characteristic of EP Toxicity the encapsulation proposal would have to be reviewed by other agencies at the Federal and or State level. Consequently, a soil sampling plan should be developed that would address this requirement. This plan should be submitted to this office for our comments and or approval.

In conjunction with the additional on site investigation, Interstate Metals should develop a soil sampling plan that would fully delineate the extent of the metals contamination. The reasons for this off site investigation were clearly indicated at the December meeting and in my subsequent letter. The supplemental report did raise several areas of concern regarding this matter. This office's position regarding these topics is as follows:

1) Purpose of Study - To fully delineate the metals contamination in the vertical and horizontal directions. Any site remediation cannot be properly performed until this delineation has occurred.

2) Method of study - Soil sampling techniques similar to those used during the initial investigation. The analysis should also include the characteristic of EP Toxicity. The specifics of this topic can be discussed and amended if necessary after the initial proposal has been submitted.

3) Persons responsible for bearing the costs - The Department of Environmental Protection lists copper, zinc, mercury, lead, and cadmium as hazardous substances. Discharges of these substances have occurred at the site. The contamination of soil at the site is a direct result of these discharges. Pursuant to the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11, Interstate Metals is liable for all costs.

4) Provisions for providing access - Interstate Metals should obtain access agreements from all parties involved.

5) Protection of participants from possible legal action -- The Department of Environmental Protection is unable to provide any protection from possible legal actions.

This office will be more than willing to meet with Interstate Metals representatives when the two areas of major importance are addressed. Be advised that the information provided in the supplemental report has been and will continue to be reviewed in an effort to answer some of the previously raised questions.

Should questions or comments arise, do not hesitate to contact me at 201-669-3960.

Sincerely,

Edward Phillips

Edward Phillips
Environmental Specialist

EP:jap

M E M O R A N D U M

TO: Neil Jiorle, Section Chief
Bureau of Planning and Assessment

FROM: Thomas Shervinskie, HSMS IV
Bureau of Planning and Assessment

SUBJECT: PRESAMPLING ASSESSMENT AT INTERSTATE METALS SEPARATING CORPORATION

On 2, February 1988, a presampling assessment was conducted at the Interstate Metals Separating Corp. located at 241 Dukes Street, Kearny in Hudson County. The Bureau of Planning and Assessment was represented by Robert Beretsky, Robert Kunze, Neil Jiorle, and Thomas Shervinskie. Edward Philips of the Bureau of Field Operations - Metro Region was also present. Representing Interstate Metals were John Crow and Ann Kruger of J.H. Crow and Barry Brown and Morley Cole of Interstate Metals.

Interstate Metals is situated between the Kearny meadows and a residential portion of town. The site is on 8.4 acres at the end of the block of Dukes Street and Tappan Street. Interstate Metals has been at this location since the early 1940's and has been in the metal reclamation and separation business since that time. Prior to 1943 this site was unoccupied.

Robert Beretsky, Robert Kunze, Neil Jiorle and Thomas Shervinskie arrived on site at approximately 0900 hours. Background readings of 1.0 ppm as methane on the OVA (serial number 62334), 0.6 ppm on the HNu (serial number 42446), and 7 micro R/Hr on the Geiger counter were established on Essex Place, west of the site. The HNu was set at a span of 2.0. All readings referred to in this memo are to be read as ppm as benzene on the HNu and ppm as methane on the OVA.

After entering the site and meeting with the Interstate Metals representatives we proceeded to the southern edge of the site near Dukes Street (refer to the attached map). The assessment began at MW #1 and proceeded in an easterly direction around the perimeter of the property. After this, the interior portion of the site was investigated. Table One summarizes all data collected from the monitor wells. There were no inner caps present on any of the monitor wells.

TABLE ONE. MONITOR WELL DATA

Monitor Well	OVA Reading (ppm)	HNu Reading (ppm)	Depth (ft)	Screened at (ft)
1	2	*	14	4-14
2	7	*	14	4-14
3	3	*	12.5	2.5-12.5
4	**	*	12	2-12
5	**	*	12	2-12
6	**	*	40	27-37
7	**	*	25	15-25
8	**	*	12	2-12

*Background
**Low battery - no reading

Two soil gas readings were taken in the immediate vicinity of MW #1. The OVA indicated levels of 1.5 and 2.0 and background readings on the HNu. Near MW #2, soil gas readings of background on the HNu and 1.6 on the OVA were recorded at a depth of approximately 2 feet near the chain-link fence marking the property line. The soil gas reading near MW #3 was taken immediately south of the well at a depth of approximately 2 feet.

Since there are several active process buildings and a pond present at Interstate Metals, soil gas readings were recorded with the OVA and HNu in these areas. All readings on the HNu were at the background level. Due to a low battery level on the OVA only four areas were surveyed with this instrument. These areas were on the east side of the property between the defunct copper processing building and the pond. Soil gas readings at the copper processing building gate were greater than 1000 on the OVA. Situated between this building and the pond is an old, iron, wrecking ball. Two soil gas readings within 10 feet of this were 70 and 300 on the OVA. The sampling depths were between 2 and 3 feet. The last soil gas reading recorded was at the eastern most edge of the pond. The OVA indicated a reading of 700 at approximately 2 feet. Interstate maintains that city sewer lines crossing the property are damaged in this area.

All Geiger counter levels were near background ($\pm$ 1 micro R/Hr) except in one area centrally located between the Brass Operations building and the Lead Smelting building. The Geiger counter indicated readings as high as 21 micro R/Hr in this area.

ColorpHast pH indicator strips were used to determine the pH in the pond, the lagoon, two discharges to the lagoon (brass operations, zinc operations) and the lead scrubber discharge. The following pH levels were observed: pond - 6; the lagoon - 9; both discharges to the lagoon - 10; and the lead scrubber discharge - 5.

Lastly, in an area east of MW #4, approximately two acres of buried scrap aluminum foil was noted. This foil was buried in the late 1940's. The amount of the foil buried is unknown.

Although on site soil, surface water and ground water sampling has been performed by J.H. Crow Consultants, the Bureau of Field Operations - Metro, in cooperation with the Bureau of Planning and Assessment has requested an additional sampling plan to include EP Toxicity sampling onsite and an offsite sampling plan to determine possible migratory pathways of contaminants from the Interstate Metals Site.

TS:mer

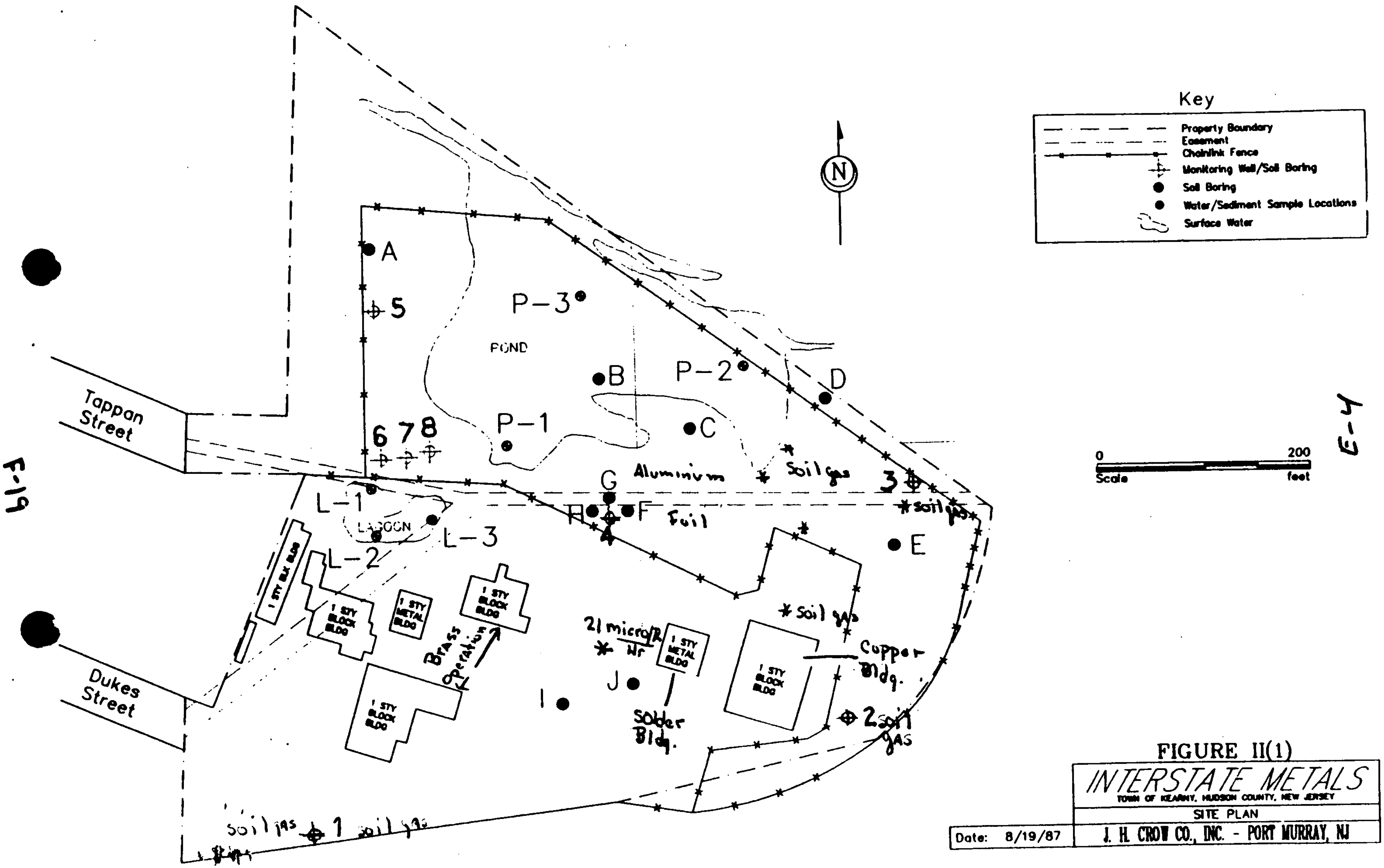


FIGURE II(1)

INTERSTATE METALS

TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY

SITE PLAN

Date: 8/19/87	J. H. CROW CO., INC. - PORT MURRAY, NJ

Form ADM-012

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Spill File DB DATE 11/24/87
through David Beeman, Spills Supervisor
FROM Ed Phillips - Environmental Specialist EP

SUBJECT Interstate Metals
Case #85-09-09-02M
File #09-07-60
Site Inspection date - 11/13/87

Background:

The John Crow Company has proposed to encapsulate the entire Interstate Metals site, approximately some 8.5 acres. The Crow Company report, as well as DEP testing, has established the levels of metals contamination within the chain link fence area. My investigation was directed at the areas which border the Interstate Metals site. Of particular concern was the open spaces to the north and east of the company property.

Investigation:

Upon my arrival at 1300 hours, I proceeded to walk the northern property border of Interstate Metals. Several pictures of this area were taken. The surface water found within Interstate's fence line extends approximately 50-75 feet beyond the fence in a northeastern direction. From this point, surficial water is confined to a series of channels that run to the north and east. The eastern terminus of these channels is the ridge containing the Conrail railroad tracks. Due to the flooded conditions, the northern terminus was not determined. Many areas of this surficial water contained rainbow sheens. Certain areas were intermittently covered with a white milky film. The direction of flow, if one exists, could not be determined. The surficial contamination was moving away from the Interstate property. This may have been due to the windy conditions occurring at the time of the investigation.

Mounded soil was quite prevalent along the north and northeast property border. The entire area to the north and east is very flat except where these mounds occur. It appears that the mounds were created by surficial dumping or bulldozing.

Prior to my departure from the northern border area, I inspected the parking lots to the west and northwest of Interstate Metals. Surficial flooding, from the pond, extended to the foundation of the building directly west of the Interstate pond. Flooding continued into the lot to the northwest of the pond. The estimated distance was 75-100 feet.

I then proceeded to walk the Conrail tracks to the south of Interstate Metals. There was some surficial flooding southeast of Interstate Metals. The extent was not as extensive as the flooding in the northeastern area. However, the surficial water did transect the fence line.

Mounds of soil were not observed in the area to the southeast. Pictures of the entire site were then taken from the Conrail ridge.

I concluded my investigation at 1335 hours.

Conclusions: Confidential

My investigation on 11-13-87 and laboratory results from the Crow report indicate to this writer that contamination extends beyond the Interstate property border. This conclusion is based upon the following:

1. The mounds of soil found at the northern border seem to indicate dumping has occurred.

2. The extensive flooding conditions may have carried contaminants off site where water levels recede.

3. Soil sample "D," from the Crow report, was taken outside the northern fence line. The levels of contamination were as follows:

Copper	64,000 ppm
Lead	15,800 ppm
Zinc	445,000 ppm
Cadmium	414 ppm

   Do these exceedingly high levels decrease immediately after crossing the Interstate property line?

4. Similarly, sample "E" which is located furthest east showed high levels:

Copper	11,800 ppm
Lead	3,180 ppm
Zinc	19,000 ppm
Mercury	63.9

Based upon these four conclusions, I feel a complete off site study should be performed to determine the horizontal extent of contamination. This investigation should be conducted prior to the approval of any remediation proposal.

F-19

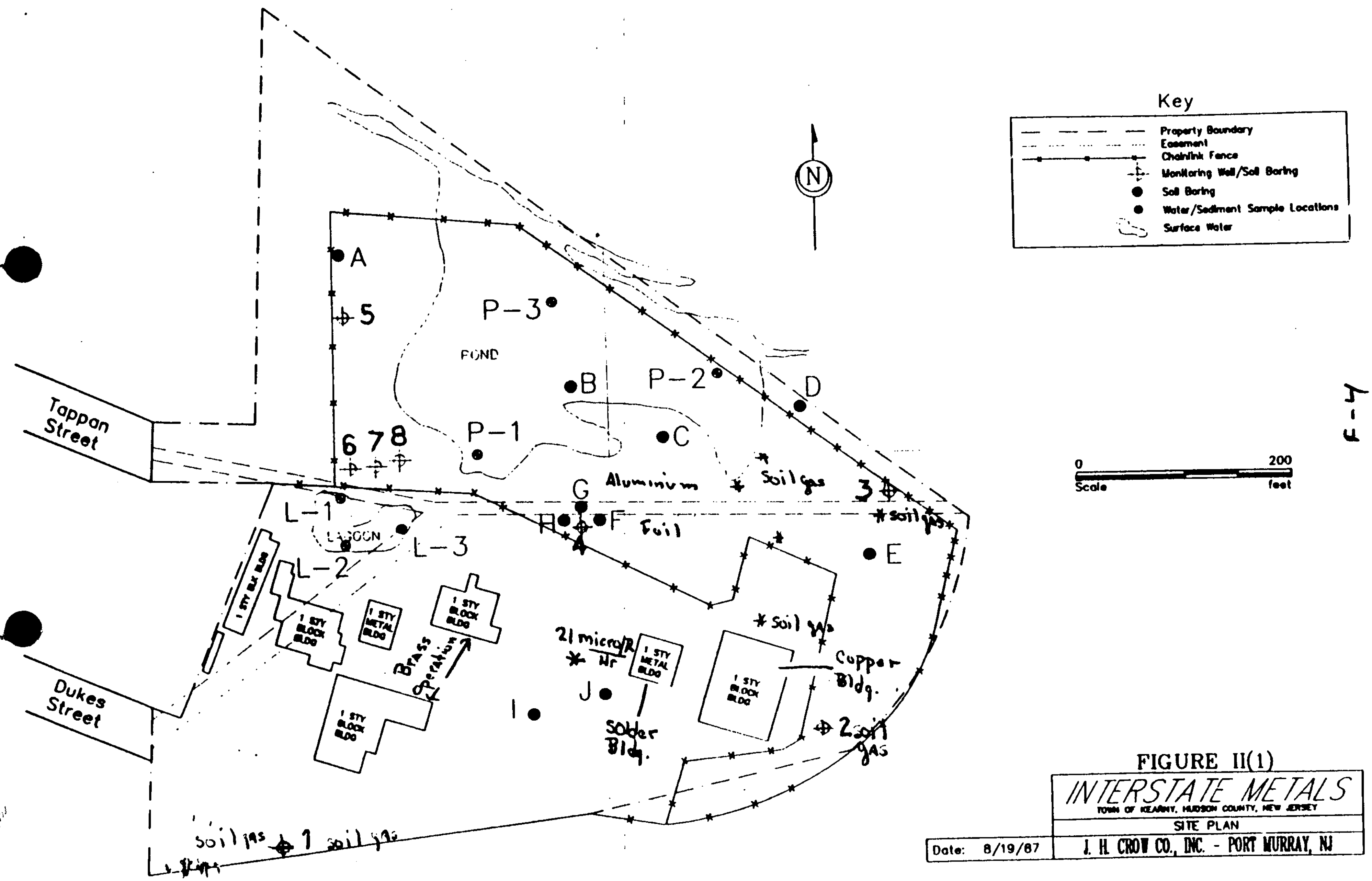


FIGURE II(1)

F-4

Form ADM-012

MEMO NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO ~~Spill File through Supervisor~~ RB DATE 11/13/87

FROM ~~Ed Phillips - Environmental Specialist~~ EP

SUBJECT ~~Interstate Metals~~
Case #85-09-19-02M
File #09-07-60
Meeting date 11-09-87

Contact: [redacted]
Former Interstate Metals Employee

Background:

In January of 1987, [redacted] reported to the Department that mercury tailings were dumped into a field behind the Interstate Metals' plant. He also stated that he was suffering from mercury poisoning. On November 5, 1987 I received a phone call from [redacted]. He was interested in acquiring information concerning the status of the site. He was informed that he could request a file review by writing Tony Cavalier, Metro Region Chief. The following day I called [redacted] to see if a meeting could be arranged to discuss Interstate Metals. On November 9, 1987 [redacted] called and indicated that he would be home all day.

Investigation:

At 1315 hours I arrived at [redacted]'s home at [redacted]. He indicated that he was an employee of Interstate Metals from July of 1979 to October of 1983 or 1984.

During that time he was a laborer involved in the various metals recovery operations of the company. In our discussion, [redacted] informed me of the following:

1. The water in the lagoon is periodically discharged so fresh water could be used in the various business operations. This is necessary due to increasing salinity, caused by evaporation, and the increasing metal content caused by normal business operations. Water from the lagoon is discharged into an adjacent manhole (see map) or to the large pond located at the northern portion of the site. The manhole contains discharge pipes which run directly to the lagoon pump.

2. The water from the lagoon is also pumped to the solder recovery building. The water is used in the smoke scrubber operation to eliminate air pollution which would normally occur. The smoke created by the heating of meters is forced

through the water to reduce contaminant levels. The water is located in a below ground pit and an above ground tank. During the process, pressure causes water from the pit to fill the above ground tank. The water level in the pit is maintained by pumping. When the operation is discontinued, overflow occurs. Evidently, the above ground tank holds more water than the pit. Due to the scrubber process, the liquid turns acidic. Mixing sulfides and water creates sulfuric acid. Therefore, the surficial overflow is acidic.

3. The lagoon was periodically cleaned by a backhoe. The material was dumped in an area directly north of the lagoon. It was then spread over the northern portion of the site.

4. The surface runoff mentioned in item 2 was collected in a pond adjacent to the building that was used for copper reclamation. A pump located inside this building periodically empties this pond to an area near the adjacent manhole. Flow sometimes infiltrates the manhole itself.

5. Mercury operations left mercury contaminated residues inside the mercury recovery building. In the center of the building, a groundwater pump was in place to provide water for the operation. Mercury tailings are located within this pump site. Tailings were also located within the building in large boxes which ran around the inside perimeter. Tailings from this operation were also piped to an area north of the solder building. At this site, the tailings were merely dumped for dispersal.

6. Dumping did occur outside the area that is fenced at the present time. The dumping involved tailings from various processes. Fly ash collected at the solder recovery building was also dumped.

7. Small pieces of scrap from the solder recovery operation was stockpiled on site. When it was profitable to do so, these scraps were refired to recover more solder. Smoke scrubbers were not used for this process. The refiring of the scrap occurred at night to mask the air pollution created by the process.

8. To recovery brass to a further degree, a similar process occurs in the building connected to the company office. Small silt sized particles are dried at night. Again to mask the air pollution created. The dried material is drummed and sold for profit.

9. Sewage did leak out of the manhole near the copper building. This occurred periodically.

10. The large pond, on the northern portion of the site, was periodically drained when levels became exceedingly high. The pump located near the lagoon was used. The manhole near the lagoon received the water.

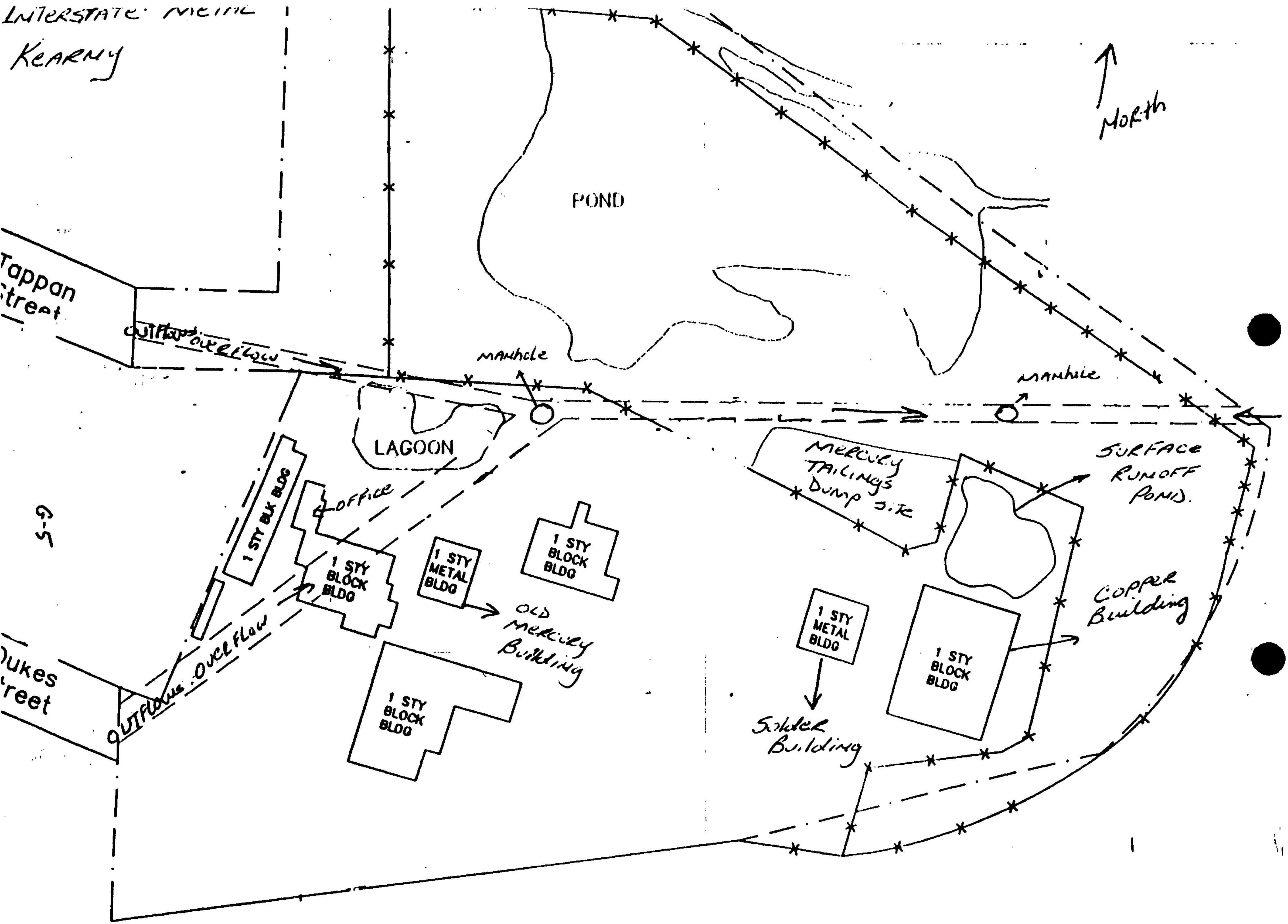
Our discussion concluded at 1435 hours.

Conclusions - Confidential

The statements made by [redacted] should not be engraved in stone as absolute truth. He probably has an axe to grind with Interstate Metals. All of his information should be investigated to determine the level of validity.

The redacted information consists of names, addresses and/or phone numbers of private individuals.

Disclosure of this information would constitute a clearly unwarranted invasion of personal privacy and thus is exempt from mandatory disclosure by virtue of Exemption 6 of the FOIA, 5 U.S.C. § 552(b)(6).



INTERSTATE METAL
KEARNY
North
POND
Tappan
Street
OUTFLOW OVERFLOW
MANHOLE
MANHOLE
LAGOON
OFFICE
1 STY BLK BLDG
1 STY BLOCK BLDG
1 STY METAL BLDG
1 STY BLOCK BLDG
OLD MERCURY Building
1 STY BLOCK BLDG
G-5
OUTFLOW OVERFLOW
ukes
treet
MERCURY TAILINGS Dump site
SURFACE RUNOFF POND.
1 STY METAL BLDG
Solder Building
1 STY BLOCK BLDG
Copper Building

Let's protect our earth

SEP 16 1987

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT

John J. Trela, Ph.D., Director
401 East State St.
CN 028
Trenton, N.J. 08625
609 - 633 - 1408

MEMORANDUM

TO: Steve Borgianini, Chief
Bureau of Planning and Assessment

THROUGH: Anthony J. Cavalier, Region Chief
Bureau of Field Operations - Metro Regional Office

THROUGH: David J. Shotwell, Chief
Bureau of Field Operations

FROM: [redacted]nvironmental Specialist EP
Bureau of Field Operations - Metro Regional Office

SUBJECT: Interstate Metals Separating Corporation
241 Dukes Street
Kearny, NJ

DATE: September 15, 1987

Purpose of Memo

Request for a Preliminary Assessment to be performed by the Bureau of Planning and Assessment.

Background

Interstate Metals has been under scrutiny of this Department for a number of years. The major components of contamination are metals; specifically mercury, lead, copper, zinc, chromium and cadmium. These metals were tested for by John H. Crow Company, Inc., hired as a consultant by Interstate, during the past year. Results indicate that contamination exists over a large portion of the eight acre site. Contamination values for these metals are frequently in the thousands of mg/kg range. Furthermore, the John H. Crow report indicates that the contamination exists to a depth of 12 feet in many areas.

Please contact me at (201) 669-3960 concerning this case.

EP:lmc

[redacted] H-1

Form VSC-006
8/86

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

TRENTON DISPATCH NOTIFICATION REPORT

CASE NO. 87 (YR) 01 (MO) 22 (DAY) TD 1045 (CASE NO.)

DATE 01 . 22 . 87 TIME (Military) 10:45 REC'D BY 87 01 22 Cooke PHONE NO. 292-7172

INCIDENT REPORTED BY:

NAME Ex. 6 PHONE Ex. 6

STREET Ex. 6

CITY STATE Ex. 6

AFFILIATION/TITLE Private Citizen

RECEIVED JAN 22 1987 TECHNICAL SERVICES

NATURE OF INCIDENT:

EMERGENCY: __ FIRE __ EXPLOSION __ AIR REL __ SPILL __ MVA __ DERAILMENT

COMPLAINT: __ SMOKE/DUST __ ODORS __ SEWAGE X OTHER (Specify) Illegal Dumping (Noise, Illegal Dumping, Fish Kill)

NOTIFICATION: (Specify) ____ (Equipment Start-up/Shutdown, Equipment Failure/Upset, etc.)

INCIDENT LOCATION:

NAME (Site) Interstate Concentrating Plant __ UNK PHONE UNK

STREET 275 Duke Street (9 Acre Site)

CITY Kearney COUNTY Hudson STATE NJ ZIP CODE ____

STATUS AT SCENE OF INCIDENT (Mitigative Actions): Company processed Mercury for 15 years.. dumping tailings into Field behind Office Building. Complaintant diagnosed as possible victim of Mercury Poisoning. Worked at Site 4 1/2 years. Terminated 3 years ago. WILL MAKE BERRY CREEK LOOK LIKE PICNIC GROUND. DATE OF INCIDENT: ON GOING SEVERAL YEARS

ANYONE INJURED	X YES __ NO Possibly)	PUBLIC EXPOSURE	__ YES X NO
ANYONE HOSPITALIZED	__ YES X NO	POLICE AT SCENE	__ YES X NO
AREA EVACUATED	__ YES X NO	FIREMAN AT SCENE	__ YES X NO
CONTAMINATION OF	__ AIR X LAND __ WATER	ASSISTANCE REQ.	X YES __ NO
POTABLE WATER SOURCE	__ YES __ NO	WIND DIRECTION	
RECEIVING WATER		WIND SPEED	

LOCATION TYPE __ CITY X INDUSTRIAL __ RURAL __ SENSITIVE POPULATION (Hospital, School, Nursing Home)

SOURCE OF INCIDENT/PROBLEM: X KNOWN __ UNKNOWN

COMPANY NAME Interstate Concentraing Plant PHONE UNK

CONTACT Barry Brown TITLE Owner

STREET 275 Duke Street

CITY Kearney COUNTY Hudson STATE NJ ZIP CODE ____

IDENTITY OF SUBSTANCE(S) SPILLED, RELEASED, DISCHARGED, ETC.: X KNOWN __ UNKNOWN

NAME OF SUBSTANCE (Gas, Liquid, Solid) Mercury Oxide/Sulfuric Acid

AMOUNT RELEASED/SPILLED UNK A/P/E ____

SUBSTANCE CONTAINED __ YES X NO __ UNKNOWN

TYPE OF RELEASE/SPILL X TERMINATED __ CONTINUOUS __ INTERMITTENT

OFFICIALS NOTIFIED: (A-310) __ BY FACILITY __ BY NJDEP

USEPA	PERSON	PHONE	DATE
LOCAL HEALTH DEPT.:	PERSON	PHONE	DATE
LOCAL MUNIC. (Fire/Police)	PERSON	PHONE	DATE

INCIDENT REFERRED TO: X DEQ __ DWR __ DSWM __ DHSM X DHWM __ DOH __ FSG

REGION: __ NORTHERN X METRO __ CENTRAL __ SOUTHERN

	PERSON		PHONE	DATE	TIME
1.	Ray Dulkis	Reg 1	669-3951	1-22-87	10:59
2.	Frank Gagliano	Reg 2	426-0799	1-22 87	11:05
3.	David Beeman	DHWM -M	669-3960	1-22-87	11:12

COMMENTS Reg. requested DHM-M notify Haz Site Mitigation

COPIES: White - Division Yellow - Trenton Dispatch Pink - Other

The redacted information consists of names, addresses and/or phone numbers of private individuals. Disclosure of this information would constitute a clearly unwarranted invasion of personal privacy and thus is exempt from mandatory disclosure by virtue of Exemption 6 of the FOIA, 5 U.S.C. § 552(b)(6).

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Water Resources
CN-029
Trenton, New Jersey 08625

FOR STATE USE ONLY

UST # ____________

	YES
CK. IN.	☐
AMT.	☐
AUTH.	☐
SP. ROUTE	☐
SITE PLN.	☐
SIGN.	☐

COMCODE ☐☐☐☐

UNDERGROUND STORAGE TANK REGISTRATION QUESTIONNAIRE

Bureau of Ground Water Quality Management
Underground Storage Tank Section
(609)984-9736

COMPLIANCE WITH THIS REGISTRATION WILL MEET ALL REGISTRATION REQUIREMENTS OF THE FEDERAL LAW, P.L. 93-616, THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984, SUBTITLE 1, SECTIONS 9001-9010.

General Facility Information

1. Facility name: INTERSTATE METAL SEPARATING CORP

2. Facility location: 275 DUKES STREET
NUMBER AND STREET
KEARNY
CITY OR MUNICIPALITY
HUDSON — COUNTY; NJ — STATE; 07032 — ZIP CODE

3. Owner's mailing address: 275 DUKES STREET
NUMBER AND STREET
KEARNY
CITY OR MUNICIPALITY
HUDSON — COUNTY; NJ — STATE; 07032 — ZIP CODE

4. Owner's name: BARRY BROWN

5. Contact person (Facility Operator) BARRY BROWN
PERSON OR TITLE

6. Contact telephone number: 201 — AREA CODE; 998 — EXCHANGE; 7660 — NUMBER

7. Total number of facility underground storage tanks 0005 (Complete Questions 12 thru 33) for each tank

8. Total facility underground storage tank capacity (gallons) 0013000

9. Type and status of owner (mark all that apply).

A. ☒ CURRENT B. ☐ FORMER C. ☐ STATE OR LOCAL GOVERNMENT D. ☒ PRIVATE OR CORPORATE E. ☐ OWNERSHIP UNCERTAIN F. ☐ FEDERAL GOVT. (GSA FACILITY I.D. NUMBER)

10. Two copies of a site plan are submitted with this registration. A. ☒ YES B. ☐ NO

Submit two (2) copies of SITE PLAN showing facility or property boundary, buildings and the location of ALL underground storage tanks. EITHER, an existing engineering site plan, if available, OR a neat and legible hand-drawn sketch of the site may be submitted. In either case the site plan or sketch MUST show the location and distances that tanks, buildings, and dispensers are from the facility's property boundary. Include all tanks that are operating or existing, (E); abandoned, (A); or closed, (C). Each underground tank on the site plan or sketch shall be numbered in accordance with the instructions for question 12. The number assigned to a tank on the site plan or sketch MUST match and be identical to the tank identification number assigned to that tank on this form.

J-1

INCLUDE FACILITY NAME, OWNER'S NAME, FACILITY ADDRESS AND TELEPHONE NUMBER ON ALL SITE PLANS.

11. All underground tanks used [illegible] January 1, 1974 including those taken o[illegible] operation, **(UNLESS THE TANK WAS REMOVED FROM THE GRO[illegible]D)** must be included in this registration. All in-ground tanks shall be reported as underground tanks on this questionnaire regardless of their current status; Existing, E; Abandoned, A; or Closed C.

SPECIFIC TANK INFORMATION

	TANK NO.	TANK NO.	TANK NO.	TANK NO.	TANK NO.
2. Tank Identification Number	A1	A2	A3	A4	A5
3. CASRN Number (Hazardous Substances Only)					
4. Tank Age (Years)	40	40	40	40	40
5. Tank Size (gallons)	5000	2000	2000	2000	2000
6. Tank Contents (MARK ONE X)					
A. Leaded gasoline	☐	☐	☐	☐	☐
B. Unleaded gasoline	☐	☐	☐	☐	☐
C. Alcohol enriched gasoline	☐	☐	☐	☐	☐
D. Light diesel fuel (No. 1-D)	☐	☐	☐	☐	☐
E. Medium diesel fuel (No. 2-D)	☐	☐	☐	☐	☐
F. Waste oil	☐	☐	☐	☐	☐
G. Kerosene (No. 1)	☐	☐	☐	☐	☐
H. Home heating oil (No. 2)	☐	☒	☐	☐	☐
J. Heating oil (No. 4)	☐	☐	☐	☐	☒
K. Heavy heating oil (No. 6)	☐	☐	☐	☐	☐
L. Aviation fuel	☐	☐	☐	☐	☐
M. Hazardous substances (per Fact Sheet)	☐	☐	☐	☐	☐
N. Other; Please Specify					

. Tank and Piping Construction (MARK ALL THAT APPLY X)	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping
A. Bare steel	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
B. Carbon steel	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
C. Stainless steel	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
D. Aluminum	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
E. Polyvinyl chloride	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
F. Concrete	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
G. Bronze	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
H. Earthen walls	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
J. Fiberglass reinforced plastic	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
K. Fiberglas-clad steel	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
L. Painted/asphalt steel	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
M. Vaulted	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
N. Composite	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
P. Iron (cast or ductile)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
R. Non-metallic	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
S. Other; Please Specify										

Tank and Piping Structure (MARK ALL THAT APPLY X)	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping
A. Single wall	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
B. Double wall	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
C. Manway in tank	☐		☐		☐		☐		☐	

Internal Tank and Piping Lining (MARK ONE X)	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping
A. Rubber	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
B. Epoxy	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
C. Alklyd	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
D. Phenolic	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
E. Glass	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
F. Clay	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
G. None J-2	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
H. Other, Please Specify										

Tank I.D. No.	TANK NO. A1		TANK NO. A2		TANK NO. A3		TANK NO. A4		TANK NO. A5	
20. Tank and Piping Lining installed (MARK ONE X)	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping
A. At purchase of tank	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
B. Retrofitted	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
21. Secondary containment (MARK ALL THAT APPLY X)	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping
A. Liner	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
B. Vault	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
C. Double wall	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
D. None	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
E. Other, Please Specify										
22. External Type/Application of Cathodic Protection (MARK ALL THAT APPLY X)	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping
A. Wrapped	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
B. Sprayed	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
C. Sacrificial anode	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
D. Impressed current	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
E. None	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
F. Other, Please Specify										
3. Monitoring/detection method (MARK ALL THAT APPLY X)	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping
A. Automatic sampling	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
B. Manual sampling	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
C. Ground water monitoring	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
D. System in secondary containment	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
E. System outside backfill	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
F. System within piping (piping leak detector)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
G. None	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
4. Type of monitoring/detection system (MARK ALL THAT APPLY X)	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping
A. Continuous	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
B. Event activated	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
C. Audio	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
D. Visual	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
E. Electric sensor	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
F. Stock/inventory control (manual)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
G. Stock/inventory control (electronic)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
H. Tile drain	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
J. Vapor sniff wells	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
K. Internal inspection	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
L. Other, Please Specify										
M. None	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Testing history recorded (MARK ALL THAT APPLY X)										
A. Yes	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
B. No	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
C. Test Result (MARK IF LEAKING NOW)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Leak/spill occurrence (MARK ALL THAT APPLY X)										
A. Within the past 1 year	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
B. Within the past 1 to 5 years	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
C. More than 5 years ago	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
D. No Records	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

Tank I.D. No.	TANK NO. A1	TANK NO. E2	TANK NO. A3	TANK NO. A4	TANK NO. E5
27. Tank Status (MARK ONE X) A. Active (operational)	☐	☒	☐	☐	☒
B. Inactive (non-operational)	☐	☐	☐	☐	☐
C. Closed (temporarily out-of-service)	☐	☐	☐	☐	☐
D. Closed (permanently out-of-service)	☐	☐	☐	☐	☐
* SEE BELOW E. Abandoned, in place	☒	☐	☒	☒	☐
F. Abandoned, in place, filled only	☐	☐	☐	☐	☐
G. Abandoned, in place, sealed only	☐	☐	☐	☐	☐
H. Abandoned, in place, filled and sealed	☐	☐	☐	☐	☐
J. Seasonal	☐	☐	☐	☐	☐
K. Prior retrofitting work, Please Specify					
L. Other, Please Specify					
28. Spill recovery system on-site (MARK ONE X) A. Yes	☐	☐	☐	☐	☐
B. No	☒	☒	☒	☒	☒
29. Overfill protection (tank only) (MARK ONE X) A. Yes	☐	☐	☐	☐	☐
B. No	☒	☒	☒	☒	☒
30. Emergency shut-off mechanisms (dispensers) (MARK ONE X) A. Yes	☐	☐	☐	☐	☐
B. No	☒	☒	☒	☒	☒

* If boxes 27 E, F, G or H above have been answered - answer questions 31, 32 and 33 below.

31. Substance last used in tank (MARK ONE X) A. Leaded gasoline	☐	☐	☐	☐	☐
B. Unleaded gasoline	☐	☐	☐	☐	☐
C. Alcohol enriched gasoline	☐	☐	☐	☐	☐
D. Light diesel fuel (No. 1-D)	☐	☐	☐	☐	☐
E. Medium diesel fuel (No. 2-D)	☐	☐	☐	☐	☐
F. Waste oil	☐	☐	☐	☐	☐
G. Kerosene (No. 1)	☐	☐	☐	☐	☐
H. Home heating oil (No. 2)	☒	☐	☒	☒	☐
J. Heating oil (No. 4)	☐	☐	☐	☐	☐
J. Heavy heating oil (No. 6)	☐	☐	☐	☐	☐
K. Aviation fuel	☐	☐	☐	☐	☐
L. Hazardous substances (per Fact Sheet)	☐	☐	☐	☐	☐
M. Other, Please Specify					
32. Estimated date last used (month/year)	04 76 Mo. Yr.	Mo. Yr.	04 76 Mo. Yr.	04 76 Mo. Yr.	Mo. Yr.
33. Estimated quantity (gallons) left in tank	0		0	0	

OWNER OR OWNER'S AGENT CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

J-4

John H. Crow, Ph.D.
(SIGNATURE)

John H. Crow
(PRINT OR TYPE NAME)

President J.H. Crow Co., Inc.
Agent/Consultant (TITLE) for Interstate

ADM-012

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO File

FROM Kevin Krause DATE January 10, 1986

SUBJECT Meeting with interstate Metals

At 1000 hrs on 1/8/86, a meeting was held at Interstate Metals to discuss heavy metal contamination at their site.

In attendance:

John Sarnas	-	Kearny Health Dept.
Morley Cole) Barry Brown)	-	Interstate Metals
Kevin Krause	-	NJDEP-DWM

The following additional fact was revealed during this meeting. Mr. Brown mentioned that in the 1960's Lou Serino Trucking under orders from the State removed illegally deposited debris and garbage from the unfenced lot adjacent to the facility. Brown claims that Lou Serino Trucking filled in the site from various Serino jobs. When asked for documentation of this claim Brown stated he had none.

My intentions to prepare a directive letter based on my sample results from 1/85 were relayed to Brown and Cole. After much discussion all parties present decided that the following steps would be taken as soon as the weather permits.

1) Two soil samples taken by the writer would be taken to a IMSC selected water quality certified lab and analyzed for EP Toxic metal parameters.

   Every effort to obtain samples from the same locationss as 1/85 will be made. Surface water and water well on site will be analyzed for priority pollutants.

2) If sample results indicate non-hazardous classification, the remaining steps will be implemented.*

3) As soon as the soil thaws, IMSC will hire a contractor to excavate soil to a particular depth possibly 2'. All excavated soils will be removed to a registered solid waste facility via a registered hauler.

4) Upon completion of the excavation, a sampling phase will commence. Samples will be analyzed for total metals as well as EP toxicity metals.

5) If sample results are below current ECRA guidelines for heavy metal contamination removal will be completed. If samples are above acceptable levels, excavation will continue.

*If the sample taken in step 1 are classified as hazardous a sampling plan will be prepared to determine the extent of contamination.

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
HAZARDOUS SITE MITIGATION ADMINISTRATION
CN 028. Trenton. N.J. 08625

IARWAN M. SADAT. P.E.
DIRECTOR

JORGE H. BERKOWITZ, PH.D
ADMINISTRATOR

MEMORANDUM

August 20, 1985

TO: Christine Altomari, Site Manager, BSM

FROM: Jonathan Savrin, Research Scientist, BEERA

SUBJECT: Interstate Metals, Review of Soil Data

Introduction

Based on the data on surface soil that were sampled on June 26, 1985, a telephone conversation with Mr. McDonald of the Hudson Regional Health Commission on July 24, and a telephone conversation with Tom Brady of the Division of Waste Management on August 9, 1985, I believe that high concentrations of contaminants in the soil surrounding the fenced-in area of the Interstate Metals facility in Kearny may pose a significant risk to the public health. The Interstate Metal facility is involved in the separation and extraction of metals from brass tailings, gas meters, etc. The Hudson Region Health Commission became aware of the possible presence of metallic contamination in June 1984, when they received a complaint from an employee about mercury on the grounds in the fenced-in area of the facility. NJDEP sampled the fenced-in area of the plant for mercury during the Summer of 1984.

The current sampling was conducted on the company's property outside of the fenced-in area. The County was concerned about the risk that was posed in this area since it is heavily used by dirt bikers (whose activities would also increase the concentrations of contaminated dust) and as an access for walks in the Meadowlands.

Soil Samples

The soil data indicates that concentrations of total chromium and mercury in the soils are well above background. These concentrations, along with expected background concentrations, are listed in Table I. Depending on their state, both of these metals can be highly toxic and/or highly mobile.

The submitted soil data indicates that a potential risk to the public health might exist but fails to delineate the extent of the contamination. Before considering remedial implementation measures, it is important to take soil samples at various depths and at various locations to delineate the vertical and horizontal extent of contamination. Groundwater and surface water also should be sampled. Since hexavalent chromium is a much more toxic than trivalent chromium, both hexavalent and total chromium should be analyzed.

Since only chromium and mercury were analyzed, the full spectra of contaminants that are present is unknown. In a factory that was involved in metal separation, it is highly probable that high concentrations of other metals and solvents are also present. It is therefore important to perform priority pollutant plus forty analyses on some of the soil and water samples.

High concentrations of mercury were found in the NJDEP soil samples from the fenced-in area of the plant in 1984. Concentrations of mercury in the three surface samples ranged from 12.7 ppm to 44.1 ppm. 7.92 ppm of mercury was also found at a depth of 18-30 inches. The presence of mercury in the fenced-in area indicates both that the plant is a source of the contamination and that additional sampling of the fenced-in area is also warranted.

Conclusion

The data from the four surface soil samples that were submitted to HSMA indicates that there is chromium and mercury contamination. The type of operation of the Interstate Metal Company and contaminated soil within their plant indicate that the plant is the source of the contamination. Additional sampling and priority pollutants plus forty scans are needed to delineate the extent of the pollution and the actual risk to the public health that is posed by the pollutants.

JS/jo
cc: Dr. Jorge Berkowitz
Dr. Merry Morris
Dr. Richard Dime
Rob Predale
John Hazen

Table I - Concentrations of Chromium and Mercury in Surface Soil Samples

Metals	Sample Number	Sample Concentrations (1)	Approx. Background Concentrations (1)
Chromium	5359	1,470	100
	5360	263	100
	5361	134	100
	5362	68.1	100
Mercury	5359	45.3	0.1
	5360	44.1	0.1
	5361	43.3	0.1
	5362	11.2	0.1

(1) All concentration valves are in parts per million.

HUDSON REGIONAL HEALTH COMMISSION
Let's Protect Our Earth

313 HARRISON AVE. HARRISON, N.J. 07029
TELEPHONE: (201) 485-7001-2

'YONNE
:RSEY CITY
OBOKEN
EEHAWKEN
'EST NEW YORK
UTTENBERG
ORTH BERGEN
ECAUCUS
EARNY
ARRISON
AST NEWARK
'NION CITY

July 3,1985

Jorge H. Berkowitz, Administrator
Division of Waste Management
32 E. Hanover Street
Trenton, New Jersey 08628

Re: Interstate Metals, 275 Duke Street,
Kearny, New Jersey

Dear Jorge,

As per our telephone conversation of July 3,1985, I have attached herewith the lab report on soil samples taken at the above referenced location and pertinent investigatory reports.

In that the lab analysis has clearly disclosed excessive levels of mercury and chromium, I am requesting your assistance in implementing remedial measures. To this end I wish to convene a meeting as soon as possible with a representative of your office and the Health Officer of Kearny so that appropriate containment and abatement strategies can be discussed.

Thank you for your cooperation.

Sincerely,

Robert Ferraiuolo,
Director

RF/jg

Enclosure

cc: Board of Commissioners

M-1

CONTINUING

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ENVIRONMENTAL LABORATORIES
380 SCOTCH ROAD. TRENTON. N. J. 08625

July 1, 1985

Mr. R. Ferraiuolo
Hudson Regional Health Commission
313 Harrison Avenue
Harrison, New Jersey 07029

Dear Mr. Ferraiuolo:

Enclosed are the analytical results of four soil samples submitted to the Bureau of Environmental Laboratories, L.C. Nos. 5359-62, Field Sample Nos. 01169-72.

Thank you for submitting your samples to our laboratories. We hope we can be of continued service to you in the future. If you have any questions regarding these samples, please call me at 609-292-9271.

Sincerely,

Eileen D Hotte

Eileen D. Hotte, Ph.D.
Chief

EDH:jb
Enclosures

M-2

ISON REGIONAL HEALTH CO ION
313 Harrison Ave.
HARRISON, N.J. 07029

FIELD INVESTIGATION

SOURCE Interstate Me ls Company

LOCATION 275 Duke Street, Kearny, N.J. 07032

MAILING ADDRESS

PERSON(S) INTERVIEWED M. Cole, V.P.; Brown, Pres.
Ed Grosvenor, H.O., John Sarnas, H.O

Premises Entered / Time In ____ a.m. p.m. Out ____ a.m. p.m.

N.C.A. ___ V.N. _______ Specific ________

COMPLAINT # ________

DATE 6/14/85 TIME 9:10

CHAPTER REF. 17

SINGLE ______ MULTIPLE ______

CLIMATIC CONDITIONS

Clear x Cloudy ___ Fog ___
Rain ___ Snow ___

WIND: Vel 8 Temp 68°
Dir SW

OBSERVATIONS:

Took 4 soil samples (01169 thru 01172) on property of company located outside of fenced in area. Samples were delivered to the Bureau of Environmental Labs, Trenton, N.J. 1:30 p.m., 6/14/85. Test results may take up to a month.

RECOMMENDATIONS:

INVESTIGATED BY: M.R. MacDonald

FURTHER ACTION:

~~P~~ M-3

BUREAU OF ENVIRONMENTAL LABORATORIES
QUA[illegible]TATIVE RESULTS & QUALITY ASS[illegible]E DATA

B. CONTROL #: 5359 SAMPLE TYPE: Soil FIELD SAMPLE #: 0116

PORT DATE: 6/26/85 SECTION SUPERVISOR: [signature] LABS SUPERVISOR: [signature]

PLICATE LC#: 5362 MATRIX SPIKE LC#: 5359

IMARY AND CONDARY* METALS[1] RAMETER	RESULTS SAMPLE DATA SAMPLE CONCEN. ug/g	MDL[3] ug/g	QUALITY CONTROL DATA ~~METHOD~~ Reagent BLANK ug/ml	LAB. DUPLICATE FIRST	SECOND	% DIFF.	MATRIX SPIKE CONCEN. ADDED ug/g	% RECOV.
SENIC								
RIUM								
DMIUM								
ROMIUM	1,470	5.0	<0.05	55.2		10.5	60	NA
PPER*	(100)							
ON*								
AD								
NGANESE*								
RCURY	45.3	0.1	<0.001	14.5		12.9	53	110
LENIUM	(.0)							
LVER								
DIUM*								
NC*								
OTHER METALS[2]								
LUMINUM								
NTIMONY								
ERYLLIUM								
ALCIUM								
OBALT								
AGNESIUM								
OLYBDENUM								
ICKEL								
OTASSIUM								
HALLIUM								
IN								
ANADIUM								

[1]Methods Reference: EPA-600/4-79-020, revised March, 1983 for water and wastewater. EPA SDW-846, second edition, July, 1982 for soil, sediment and sludge.

[2]Methods Reference: EPA FR Dec. 3, 1979 for ICP results.

[3]B.E.L. established Method Detection Limits

BU   OF ENVIRONMENTAL LABORATOR
QUAN   IVE RESULTS & QUALITY ASSU   DATA

. CONTROL #: 5360   SAMPLE TYPE: Soil   FIELD SAMPLE #: 01170

ORT DATE: 6/26/85   SECTION SUPERVISOR: LAB. SUPERVISOR:

LICATE LC#: 5362   MATRIX SPIKE LC#: 5359

	RESULTS SAMPLE DATA		QUALITY CONTROL DATA					
				LAB. DUPLICATE			MATRIX SPIKE	
MARY AND ONDARY* METALS[1] AMETER	SAMPLE CONCEN. ug/g	MDL[3] ug/g	~~METHOD~~ Reagent BLANK ug/ml	FIRST	SECOND	% DIFF.	CONCEN. ADDED	% RECOV.
ENIC								
IUM								
MIUM								
OMIUM	263	5.0	<0.05	55.2		10.5	60	NA
PER*								
N*								
D								
GANESE*								
CURY	44.1	0.1	<0.001	14.5		12.9	53	110
ENIUM								
VER								
IUM*								
IC*								
THER METALS[2]								
MINUM								
IMONY								
YLLIUM								
CIUM								
ALT								
NESIUM								
YBDENUM								
KEL								
TASSIUM								
ALLIUM								
N								
NADIUM								

[1] Methods Reference: EPA-600/4-79-020, revised March, 1983 for water and wastewater.
EPA SDW-846, second edition, July, 1982 for soil, sediment and sludge.

[2] Methods Reference: EPA FR Dec. 3, 1979 for ICP results.

[3] B.E.L. established Method Detection Limits

AB. CONTROL #: 5361 AMPLE TYPE: Soil SAMPLE #: 1171

EPORT DATE: 6/26/85 SECTION SUPERVISOR: [signature] LAB. SUPERVISOR: [signature]

UPLICATE LC#: 5362 MATRIX SPIKE LC#: 5309

	RESULTS		QUALITY CONTROL DATA					
	SAMPLE DATA			LAB. DUPLICATE			MATRIX SPIKE	
RIMARY AND ECONDARY* METALS[1]	SAMPLE CONCEN. ug/g	MDL[3] ug/g	~~METHOD~~ Reagent BLANK ug/ml	FIRST	SECOND	% DIFF.	CONCEN. ADDED	% RECOV.
ARAMETER								
RSENIC								
ARIUM								
ADMIUM								
HROMIUM	134	5.0	<0.05	55.2		10.5	60	NA
OPPER*								
RON*								
EAD								
ANGANESE*								
ERCURY	43.3	0.1	<0.001	14.5		12.9	53	110
ELENIUM								
ILVER								
ODIUM*								
INC*								
OTHER METALS[2]								
LUMINUM								
NTIMONY								
BERYLLIUM								
ALCIUM								
OBALT								
MAGNESIUM								
MOLYBDENUM								
NICKEL								
POTASSIUM								
THALLIUM								
TIN								
VANADIUM								

[1]Methods Reference: EPA-600/4-79-020, revised March, 1983 for water and wastewater. EPA SDW-846, second edition, July, 1982 for soil, sediment and sludge.

[2]Methods Reference: EPA FR Dec. 3, 1979 for ICP results.

[3]B.E.L. established Method Detection Limits

BUREAU OF ENVIRONMENTAL LABORATORIES
QUAN[illegible]TATIVE RESULTS & QUALITY ASSU[illegible]E DATA

CONTROL #: 5362 SAMPLE TYPE: Soil FIELD SAMPLE #: 1172
ORT DATE: 6/26/85 SECTION SUPERVISOR: [illegible] ~~LAB.~~ SUPERVISOR: [illegible]
PLICATE LC#: 5362 MATRIX SPIKE LC#: 5359

IMARY AND CONDARY* METALS[1] RAMETER	RESULTS SAMPLE DATA SAMPLE CONCEN. ug/g	MDL[3] ug/g	QUALITY CONTROL DATA ~~METHOD~~ Reagent BLANK ug/ml	LAB. DUPLICATE FIRST	SECOND	% DIFF.	MATRIX SPIKE CONCEN. ADDED	% RECOV.
SENIC								
RIUM								
DMIUM								
ROMIUM	68.1	5.0	<0.05	55.2		10.5	60	NA
PPER*								
ON*								
AD								
NGANESE*								
RCURY	11.2	0.1	<0.001	14.5		12.9	53	116
LENIUM								
ILVER								
ODIUM*								
INC*								
OTHER METALS[2]								
LUMINUM								
NTIMONY								
ERYLLIUM								
ALCIUM								
OBALT								
AGNESIUM								
OLYBDENUM								
ICKEL								
POTASSIUM								
THALLIUM								
TIN								
VANADIUM								

[1]Methods Reference: EPA-600/4-79-020, revised March, 1983 for water and wastewater.
EPA SDW-846, second edition, July, 1982 for soil, sediment and sludge.

[2]Methods Reference: EPA FR Dec. 3, 1979 for ICP results.

[3]B.E.L. established Method Detection Limits

HAZARDOUS WASTE INVESTIGATION

Inspector: Mike Nalbone Date: 5/14/81

Location: Interstate Metals Separating HW/EF 10-69

St: Duke St.

Town: Kearny

County: Hudson

Lot: Block:

Origin of Complaint:

Complaint: Samples to be taken for a representative analysis of the waste pile stored on site.

Findings:

On 5/14/81, Wayne Howitz and I visited International Metals Separating in Kearny, NJ. We spoke with Mr. Brown, supervisor, and Mr. Cole, vice president, regarding the waste pile on site. (Note: this waste pile according to IMS has minimal amounts of mercury so they are applying for landfill disposal.) We indicated to Mr. Cole that we were specifically here on site to take a more representative sample of the waste pile. I explained that since those samples which were taken previously were surface samples, and we were now interested in bore samples.

Mr. Brown and Mr. Cole were bojective about the situation since we did not notify them that we were visiting the site. They then siad that we could sample the pile of material. Mr. Brown showed the pile of dirt material to Wayne and me. Mr. Brown was notified at this time that we would be taking approximately four samples and he would get the (C) sample from each.

Wayne and I took sample #1 at approximately 11:50 AM and is designated as WH022. The sample was taken at a depth of 20" below the surface (see sketch). Sample #2 was taken at approximately 12:15 PM and is designated as WH023. The sample was taken at a depth of 20" below the surface (see sketch). Sample #3 was taken at approximately 12:30 PM and is designated as WH024. This sample was taken at a depth of 17" below the surface. The last sample, sample #4 was taken at approximately 12:55 PM and is designated as WH024 (see sketch). This sample was taken at a depth of 12" below the surface.

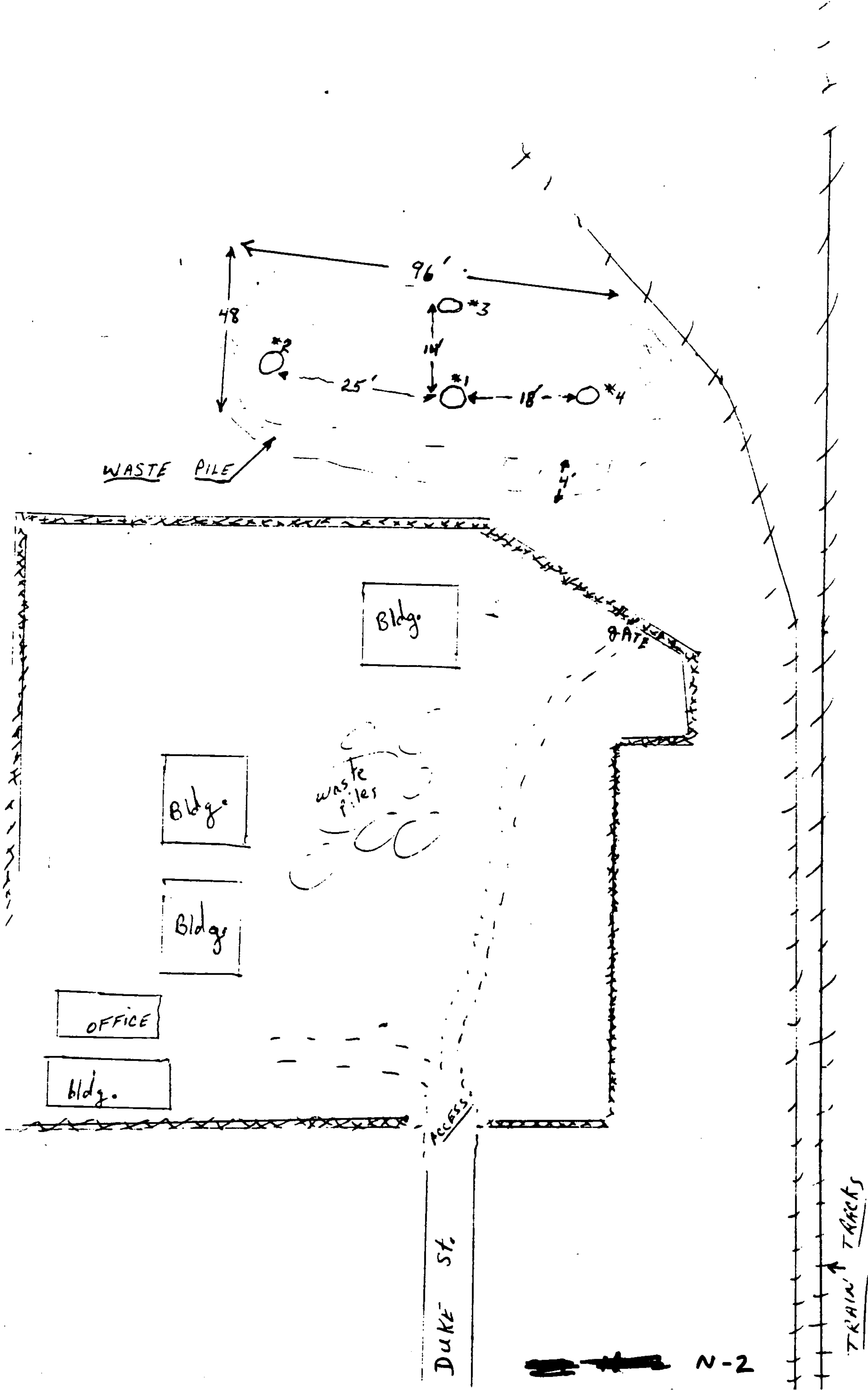
The entire pile of dirt material is approximately 4' high, 48" wide and 96" long. The exact distance from each sample bore is listed on the attached sketch.

Then the samples were taken the (C) samples which were four in total were given to Mr. Cole, vice president. Mr. Cole typed a letter designating that we were on site on the 14th, unannounced and took samples of the pile which was regarded as non-hazardous by EPA. A signature was required by both Wayne and me on the letter. Wayne requested that a copy be sent to his office for our file, Mr. Cole agreed.

The samples were documented on the appropriate lab data sheets and a chain of custody was made out. The samples were then taken to the lab in Camden, NJ for analysis.

[redacted] [redacted] N-1

/14/81 Interstate ools, Separating



[redacted] N-2

HAZARDOUS WASTE INVESTIGATION

Inspector: Mike Nalbone   Date: 3/24/81

Location: Interstate Metals Separating Co.

St: 275 Duke St.

Town: Kearny

County: Hudson

Lot: --   Block:

Origin of Complaint:

Complaint: Requested to check out and classify waste on site

Findings:

On 3/24/81 I visited Interstate Metals Separating Co. to classify a pile of waste on site. I spoke to Barry Brown the foreman of Interstate Metals about the material. He told me that a company in Maine used mercury in one of their processes. The company building was demolished but it was thought that the floor of the building still contained a large amount of mercury. Interstate Metals had the floor of this building transported to their Kearny site. After checking for levels of mercury, it was found that none existed according to Mr. Brown. If mercury was found in the soil and rock, Mr. Brown said the company would have separated the mercury out.

The pile of soil and rock was approximately 35' in length and 10' in width and 4' in height. No buckets, drums, bottles or trash was mixed in with this material. Samples were taken at this time and sample data sheets as well as a chain of custody were filled out. Both soil samples and rock samples were taken and for every set of samples taken an additional duplicate sample was taken for Barry Brown of Interstate Metals.

Sample #'s taken 003AB, 004AB, 005AB.

Mike Nalbone

Mike Nalbone

RECOMMENDATION

3/24/81

I did not visually see any form of mercury within the soil and rock although I will not make a determination of this material until an analysis is made specifically checking for mercury.

Mike Nalbone

Mike Nalbone

The Reutter Building, Ninth and Cooper Streets
Camden, New Jersey 08101
Telephone: 609 - 541-6700 TWX: 7108910547

April 17, 1981

NJDEP
Solid Waste Division
32 Hanover Street
Trenton, NJ 08625

Attention: Mr. Wayne Howitz, Hazardous Waste Bureau

Reference: Test Report No. S-1378

This report covers the evaluation of two (2) waste samples submitted to Stablex-Reutter, Inc. (SRI) on April 3, 1981 for analysis of Mercury content. The analysis adhered to the procedure as described in the U.S.E.P.A Methods for Chemical Analysis of Water and Wastes, 1974.

The sample designations and results are as follows:

	MN 003 A	MN 004 A
Mercury, ugms/gm	500	83

If you have any questions concerning this analysis, please don't hesitate to contact us. Copies of the Chain of Custody Records are attached.

Respectfully submitted,

STABLEX-REUTTER INC.

Catherine McCormick

Catherine McCormick
Assistant Laboratory Manager

CMC/bd
Att.

0-3

Br L Rock - See me reap. R

STATE OF NEW JERSEY
DEPARTMENT OF LABOR AND INDUSTRY

JOHN J. HORN
Commissioner

OFFICE OF BUSINESS ADVOCACY
LABOR AND INDUSTRY BUILDING
TRENTON, NEW JERSEY 08625

ROCCO V. GUERRIERI
609-292-0700

February 11, 1981

Mr. Tim McGuinness
Senior Environmental Specialist
Hazardous Waste
Solid Waste Administration
Department of Environmental Protection
32 East Hanover Street
Trenton, New Jersey 08625

Dear Mr. McGuinness:

Pursuant to our conversation I was requested by Barry Brown of Interstate Metals Separating Company to request an evaluation of waste rock that he wishes to remove from his factory site. You requested a visual description of the rock. The material is cement rock slabs of various sizes. Some are the size of a grapefruit while others are as large as footballs.

The material was the result of a demolition of a plant floor in Maine. There is approximately 400,000 to 600,000 pounds of this material including some soil that will no doubt be part of the clean-up. Interstate has stored this material for many years and now wishes to clear this site for company use.

Enclosed you will find a letter from the U.S. Environmental Protection Agency who judged the material not to be a hazardous material. I would appreciate your correspondence being directed to Mr. Barry Brown, Interstate Metals Separating Company, 275 Dukes Street, Kearny, New Jersey 07032. Please send me a copy of this correspondence. I have also included copies of Report of Assay and Report of Test which were performed by International Testing Laboratories, Inc. to assist in your determination.

Your attention to this matter will be greatly appreciated.

Sincerely,

Samuel Mastrull
Permit Coordination Officer

SM:i
Enc.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK NEW YORK 10278

January 29, 1981

Mr. Barry Brown
Interstate Metals Separating Co.
275 Dukes Street
Kearny, NJ 07032

Dear Mr. Brown:

At the request of Sam Mastrull of the New Jersey Office of Business Advocacy, I have examined a copy of the laboratory analysis on a sample of waste rock which you supplied. Based on that analysis, the waste is not a hazardous material by the Environmental Protection Agency's (EPA) definition and therefore need not be handled according to hazardous waste regulations.

Thank you for your concern and cooperation.

Sincerely yours,

Alan Stern

Alan Stern
Environmental Scientist
Solid Waste Branch

cc: Sam Mastrull
Office of Business Advocacy
New Jersey Dept. of Labor and Industry

STATE OF NEW JERSEY
DEPARTMENT OF LABOR AND INDUSTRY
OFFICE OF BUSINESS ADVOCACY
LABOR AND INDUSTRY BUILDING
TRENTON, NEW JERSEY 08625

JOHN J. HORN
Commissioner

ROCCO V. GUERRIERI
609-292-0700

December 23, 1980

Mr. Allan Stern
Federal EPA
Solid Waste Branch
26 Federal Plaza
New York, New York 10278

Re: Interstate Metals Separating Co.

Dear Mr. Stern:

The above named company previously made requests to your office for an evaluation of a solid waste material. In our discussion today, I verbally stated the contents of the sampling done by International Testing Laboratories, Inc. Although you assured me the level of elements reported in the testing was not sufficient enough to concern you, the company requests me to send a copy of the report of the test for you to send a correspondence indicating your verbal statements to me that the material is not hazardous.

I appreciate your assistance in this matter and best wishes for a happy holiday season.

Sincerely,

Sam Mastrull

Sam Mastrull
Permit Coordination Officer

SM:i
Enc.
cc: Barry Brown
Max Frenkel

BRANCH OFFICES
Chicago, Illinois
Philadelphia, Pennsylvania

International Testing Laboratories, Inc.

Materials Testing and Consulting Engineers

578-582 MARKET STREET
NEWARK, N. J. 07105

PHONES (201) 589-4772-3-4

Cable Address: INTEL
Telex: 139187

REPORT OF ASSAY

No. 457858 DATE August 26, 1980

Our assay of the sample of Rock

From Interstate Concentrating Company

Marked:

and submitted to us, show

A.	Organic Bound Chlorine (Wt.%)		:	NONE
B.	pH of Water Extract		:	7 - 10
C.	Salts :	Silicon Dioxide	:	32.14%
		Aluminum Oxide	:	2.57%
		Ferric Oxide	:	2.68%
		Calcium Oxide	:	7.92%
		Magnesium Oxide	:	1.22%
		Calcium Carbonate	:	0.68%
		Sand as SiO_2	:	52.12%
D.	Metallics :	Mercury	:	0.018%
E.	Organic		:	NONE
F.	Inorganic :			
	Sand :	Silicon Dioxide	:	52.12%
	Cement :	Silicon Dioxide	:	32.14%
		Magnesium Oxide	:	1.22%
		Calcium Oxide	:	7.92%
		Ferric Oxide	:	2.68%
		Aluminum Oxide	:	2.57%
		Calcium Carbonate	:	0.68%
		Mercury	:	0.018%

To

Interstate Concentrating Company
Kearny, New Jersey

INTERNATIONAL TESTING LABORATORIES, INC.

David H. Hoffman

ITL 102 5M 2-79

BRANCH OFFICES
Chicago, Illinois
Philadelphia, Pennsylvania

International Testing Laboratories, Inc.

Material Testing and Consulting Engineers
Weighers, Samplers and Assayers
578-582 MARKET STREET
NEWARK, N. J. 07105
PHONE (201) 589-4772-3-4

Cable Address: INTEL
Telex: 139187

REPORT OF TEST

No. 457858 DATE Dec. 8, 1980

From Interstate Metals Separating Co.
275 Duke St.
Kearny, N.J.

Sample of : Rock

	RESULTS	LIMITS OF DETECTION
Antimony	None detected	0.50 ppm
Arsenic	None detected	0.8 ppm
Barium	0.70 ppm	
Cadmium	None detected	0.025 ppm
Chromium	0.24 ppm	
Lead	None detected	0.50 ppm
Mercury	None detected	4.7 ppb
Nickel	0.32 ppm	
Selenium	None detected	0.50 ppm
Silver	0.28 ppm	

The analytical procedure for the solid waste was conducted according to EPA, Hazardous Waste and Consolidated Permit Regulations, Federal Register, Vol. 45, No. 98, May 19, 1980, Appendix II, Acetic Acid Extraction Procedure.

To
Interstate Metals Separating Co.
Kearny, NJ.

INTERNATIONAL TESTING LABORATORIES, INC.

ITL 102 5M 4-80

Form VEM-017
6/93

2

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF ENVIRONMENTAL QUALITY
AIR POLLUTION CONTROL PROGRAM
BUREAU OF ENGINEERING AND TECHNOLOGY

All Correspondence must indicate your DEP PLANT ID NUMBER

DEP PLANT ID 10232

Permit/Certificate Number 007992

(Mailing Address)

INTERSTATE METAL SEPARATING CO
275 DUKE STREET
KEARNY NJ 07036

(Plant Location)

INTERSTATE METAL SEPARA
275 DUKE STREET
KEARNY

Applicant's Designation of Equipment METAL ROASTERS W/SRUBBER
No. of Sources 02
No. of Stacks 001
N.J. Stack No. 001
Effective 11/25/79
Expiration 11/25/89
Original Approval 11/25/74

CERTIFICATE TO OPERATE CONTROL APPARATUS OR EQUIPMENT (5 YEAR RENEWAL)

THIS (5 YEAR RENEWAL) CERTIFICATE IS BEING ISSUED UNDER THE AUTHORITY OF CHAPTER 106, P.L. 1967 (N.J.S.A. 26:2C-9.2). THE POSSESSION OF THIS DOCUMENT DOES NOT RELIEVE YOU FROM THE OBLIGATION OF COMPLYING WITH ALL OTHER PROVISIONS OF TITLE 7, CHAPTER 27, OF THE NEW JERSEY ADMINISTRATIVE CODE.

YOU MAY BE ENTITLED TO AN EXEMPTION OF TAXATION IF YOUR EQUIPMENT IS TAXED AND IS CONSIDERED TO BE AN AIR POLLUTION ABATEMENT FACILITY. A TAX EXEMPTION APPLICATION MAY BE OBTAINED FROM THIS SECTION.

IF IT IS NECESSARY TO AMEND YOUR EMERGENCY STANDBY PLANS, PLEASE CONSULT WITH THE APPROPRIATE FIELD OFFICE. (SEE OTHER SIDE).

THIS DOCUMENT MUST BE READILY AVAILABLE FOR INSPECTION AT THE PLANT.

N.J. Department of Environmental Protection
Division of Environmental Quality
CN-027
Trenton, New Jersey 08625

Approved by: ______________________
Supervisor
New Source Review Section

03/08/94-12

HUDSON REGIONAL HEALTH COMMISSION T-1

NEW JERS[EY] STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPLICATION FOR PERMIT TO CONSTRUCT, INSTALL OR ALTER CONTROL APPARATUS OR EQUIPM[ENT]

TO: New Jersey State Department of Environmental Protection
Bureau of Air Pollution Control
P. O. Box 1390
Trenton, New Jersey 08625

Use instructions, Air-D13

Date October 12, 1972

Sec. A

1. Full Business Name INTERSTATE METALS SEPARATING COMPANY
2. Address of equipment and/or control apparatus:
275 (No.) Duke Street (Street) Kearny (Municipality) Hudson (County)
3. Location on premises (Bldg., Dept., area etc.) Meter Oven Building
4. Nature of Business Metals separation SIC No. ____

Sec. B

1. ☐ New process equipment and new air pollution control apparatus
☒ New air pollution control apparatus on existing process equipment
☐ New process equipment with no control apparatus
☐ Other: ____
2. Prior permit numbers covering this installation. Specify. None
3. Estimated starting date October 20, 1972 Estimated completion April 20, 1973

Sec. C

1. Description of operation Roasting of gas meters to separate component metals and subsequent forming of metal ingots.
2. Identify process equipment See attached sketch.
3. Raw materials (names) Used gas meters containing tin, lead, and other metals.
Total pounds per hour 1000
4. Operating procedure:
☒ Continuous: 8 hrs. per day 5 days per ☒ week ☐ month Total pounds per batch ____
☐ Batch: ____ hrs. per batch ____ Batches per ☐ day ☐ week

[Sec.] D

Physical and chemical nature of air contaminants which must evolve from operation and be emitted into the open air:

AIR CONTAMINANTS	AMOUNTS OF CONTAMINANTS With Control Apparatus	Without Control Apparatus
Particulate		
Tin oxide		
Lead Oxide		
Hydrocarbon	Less than 0.5 lb. Per hour	10 lb./hr. estimated

(Continue on reverse side)

T-2

Sec. E

1. Describe air pollution control apparatus See attached

2. Efficiency of control apparatus: 95+ %

3. Height of discharge above ground 45 ft.

4. Distance from discharge to nearest property line 100 ft.

5. Volume of gas discharged into open air 4500 cu. ft. per min. at stack conditions

6. Exit linear velocity at point of discharge 1300 ft. per minute at stack conditions

7. Temperature at point of discharge 150 °F

8. Will emissions comply with existing local requirements? Yes

9. Initial cost of control apparatus $ 16,000

10. Estimated annual operating cost $ 1,500

This application is submitted in accordance with the provisions of N.J.S.A. 26:2C-9.2, and to the best of my knowledge and belief is true and correct.

Signature - all copies

Mr. Barry Brown
Name (Print or type)

Mailing Address

Plant Manager
Title

Zip Code

201 998-7660
Telephone No.

DO NOT WRITE BELOW

PERMIT TO CONSTRUCT, INSTALL OR ALTER CONTROL APPARATUS OR EQUIPMENT

Application for permission to construct, install or alter the equipment and/or control apparatus as set forth above is APPROVED.

Date 10.16.72

Approved by:

PERMIT NO. P 9044

Supervisor, Permits & Certificates

Submit original and three (3) copies

#3

To: Tom Leonard

From: John Strong

Subject: Interstate Metal Seperating Corp
275 Dukes St, Kearny

Person Interviewed: Barry Brown - Pres.

Date of Investigation: 3-23-82 1:00 - 2:00 pm

Purpose of Investigation: Is company smelting lead batteries in their Kilns. See attached Note from J. Walsh

Investigation

On 3-23-82 the undersigned met with Mr. Brown and conducted a plant inspection. Subject company has 2 Kilns; 1 Kiln is used to evaporate water from a copper slurry. This unit due to the economy is not in operation. The other Kiln was observed in operation roasting condemned gas meters to recover the solder to form ingots. The remaining metal parts to the gas meter are hand seperated to recover the assorted metal components: brass, steel etc. Emissions are controlled by a venturi scrubber. At the time of the inspection emissions at stack exhaust were well within the allowable. While touring the plant yard no signs or indications that batteries were being smelted were observed. Plant yard was considerably clean considering the nature of the business.

Conclusion: At the time of the inspection the inspector did not observe any signs which would indicate that subject company is violating their air pollution permit by smelting lead batteries.

Recommendation: Follow-up at regular monthly inspection
File #3.

[illegible signature]
C Env. Spec.

[illegible]
Company has 2 [illegible]
[illegible]

[illegible] Cooler?
[illegible]
to recover Lead & Tin from
Condemned [illegible]
the other is for evaporating
Water from a Copper Slurry.

A neighbor called & said
they are incinerating lead batteries
to recover Lead. This started
within the last couple of weeks
T.)

MAX FRENKEL

ENVIRONMENTAL ENGINEERING & CONSULTING

AIR
WATER
WASTE
NOISE
ENERGY
O.S.H.A.

REPLY TO:

September 27, 1978

Mr. Walter J. Nicol, Health Officer
Kearny Dept. of Public Health and
Environmental Protection
645 Kearny Avenue
Kearny, N.J. 07032

RE: Interstate Metals Separating Co.

Dear Mr. Nicol:

We have received a copy of your letter dated September 12, 1978, to Mr. Cole of Interstate Metals regarding Mr. MacDonald's inspection of the metals pouring process, and a possible absorption of lead by employees.

Mr. Max Frenkel and I visited the Interstate Metals plant on September 20th, and witnessed the pouring of the metal into molds, which was conducted in the same manner as was observed by Mr. MacDonald of the North Hudson Regional Health Commission.

We have observed that the molds are first smeared with a very thin layer of petroleum lubricating oil, and then the molten metal is poured into the molds. Without the oil smear in the mold, as the metal cools, the air within the trapped air bubbles expands and causes the bursting of the bubbles.

The thin oil smear on the bottom of the mold prevents splattering of metal during pouring, because the thin film of oil, by evaporating slowly through the molten metal, causes the metal to stir and prevents pockets of air to be trapped inside the metal. The smoke one notices is from the oil evaporating inside the mold.

The amount of oil used to smear the molds is less than a pint per day, or about one pound for all the molds. This oil is evaporated during approximately the half hour that the pouring of metal is conducted during a typical work day. We do not feel that the oil fumes, which are saturated hydrocarbons, are harmful. The pouring of metal into the molds would be quite hazardous if the oil was not smeared on the bottom of the mold, because of the excessive splattering of metal which would occur otherwise.

Contd......

ONE CHERRY HILL – SUITE 617 CHERRY HILL, N. J. 08002 (609) 779-8112

ECOLOGY INTERNATIONAL - Rec'd 8/31/78 857

AIR
WATER
WASTE
NOISE
ENERGY
O.S.H.A.

ENVIRONMENTAL ENGINEERING & CONSULTING

August 28, 1978

REPLY TO: One Cherry Hill
Suite 617
Cherry Hill, N.J.
08002

Mr. L. Stetile, Director
Hudson Regional Health Commission
532 Summit Avenue
Jersey City, New Jersey 07306

Subject: Implementation Plan to Reduce the Dust Formation Within the Interstate Metals Separating Company Plant in Kearny, New Jersey.

Dear Mr. Stetile:

As requested by you during the meeting of August 22nd at the Interstate Metals plant in Kearny, attented by the Town of Kearny Public Health Inspector, Mr. Tintle, Mr. MacDonald of your Commission, officials of Interstae Metals and Ecology International, we are submitting herewith an implementation plan to reduce dust formation within the plant boundaries at 275 Dukes Street in Kearny, New Jersey.

A. To reduce dusting produced by trucks driving within and out of the Interstate Metals plant:

1. Cover the entrance to the yard, as well as the area near the weighing station with 1½ inch crushed rock;
2. Wash the wheels of trucks leaving the plant;
3. Limit the speed limit of all vehicles to 5 MPH.

Actions Taken: Crushed rock is being delivered now and is being spread at key locations. The water connections for wheel washing are being installed now and wheels of all trucks leaving the premises will be washed beginning about September 7th. A sign is being ordered now and should be installed within about ten days.

In addition to the above, the management of Interstate Metals has undertaken the task of sweeping Duke Street up to about 200 feet from its plant boundaries every Monday morning.

B. To reduce the dust pick-up from the metal-sand inventory piles:

1. Cover piles near the front of the property with 4 mil polyethylene sheeting.

Action Taken: Polyethylene sheeting has been ordered and covering of inventory piles will begin within ten days. Only the unconsolidated sand metal piles will be covered near the entrance to the plant to evaluate this method of dust control.

PORATE & MAIN OFFICE:
COOLIDGE RD., CHERRY HILL, N.J. 08002
779-8112

TOWER OF FORTY ONE: SUITE 408
4101 PINE TREE DR., MIAMI BEACH, FL. 33140
(305) 672-5657

C. To reduce the velocity of wind within the plant boundaries, and thus reduce the pick-up of dust in the plant and the carry over of dust out of the plant's premises:

   1. Install wind breakers in the chain link fence in areas where there is wind tunnelling due to different building locations, building heights, etc.

   Action Taken: Prices have been obtained for different size inserts that fit into the chain link fence. The effectiveness of the inserts will be tested on the northern side of the plant where the localized wind is highest. There is the problem of increased stress loadings on the fence when the passage of wind is blocked. Some posts may have to be replaced. In about one month we will evaluate this method of dust control.

I trust that the above actions taken by our client will meet with your approval and the agreement of the town inspector. As you can see, the Interstate Metals Separating Company, which for more than fourty years has been in this location in the resource recovery field serving primarily local industry, is showing willingness to comply with the laws of the State fully and wants to be a good neighbor in the community.

Please feel free to call me or to write, if you have any questions. I intent to keep you informed of the progress being made.

Very truly yours,

Max Frenkel, Consultant to
Interstate Metals Separating Company

cc: Mr. Edward R. Tintle, Town of Kearny ✓
Mr. Morley C. Cole, Interstate Metals
Mr. Barry Brown, Interstate Metals
Mr. Milton R. MacDonald, Hudson Regional Health Commission
Mr. Lubomyr Kurylko, Ecology International

Your suggestion that Interstate Metals start monitoring the blood/urine for lead content as a preventive health measure has been fully accepted by their management. I was informed that they will have all their employees, who work in the metals pouring area, tested by a medical laboratory within the next few days.

Interstate Metals appreciates your letter and suggestions of September 12th, and they and we wish to assure you that their employees' health is of their utmost concern. We, as their environmental consultants, will be closely watching the results of the lead content monitoring.

Sincerely yours,

L. Kurylko

pp - MAX FRENKEL
Environmental Engineering & Consulting

LK:rl

cc: Mr. Morley Cole

Mr. MacDonald

u-4

532 SUMMIT AVENUE
JERSEY CITY, NEW JERSEY 07306

REPORT OF FIELD INVESTIGATION

ATE August 22, 1978 TIME 10:30 - 12:15 FILE# 004

REFERENCE TO CHAPTER

JLL BUSINESS NAME Interstate Metal Corp.

ocation 275 Duke St. Kearny, N.J. 07032

No. Street Municipality

ailing Address same

No. Street Post Office Zip Code

erson(s) Interviewed Barry Brown; Morley Cole President

Title

ubdmyr Kurylkd; Max Frankel Consultants

Title

omments Ed Tintle - Al Statile - M.R. Mac Donald - Purpose to discuss control of dust.

eport Requested by

Title

urpose of Investigation Complaints received regarding fugitive metallic dust emanating at this site.

bservations Possibilities discussed include - truck tire bath, macadum driveway, crushed stone, sweeper, vacuum, building enclosures and fencing.

onclusions Will be reached by Interstate and their consultants. We will be advised via mail next week (8/28/78)

ecommendations

Investigated by M.R. Mac Donald

Signed

V-1

Inspector

Title

532 SUMMIT AVENUE
JERSEY CITY, NEW JERSEY 07306

REPORT OF FIELD INVESTIGATION

DATE August 22, 1978 TIME 10:30 - 12:15 FILE# 004

REFERENCE TO CHAPTER

FULL BUSINESS NAME Interstate Metal Corp.

Location 275 Duke St. Kearny, N.J. 07032
No. Street Municipality

Mailing Address same
No. Street Post Office Zip Code

Person(s) Interviewed Barry Brown; Morley Cole — President
Title

Lubdmyr Kurylkd; Max Frankel — Consultants
Title

Comments Ed Tintle - Al Statile - M.R. Mac Donald - Purpose to discuss control of dust.

Report Requested by
Title

Purpose of Investigation Complaints received regarding fugitive metallic dust emanating at this site.

Observations Possibilities discussed include - truck tire bath, macadum driveway, crushed stone, sweeper, vacuum, building enclosures and fencing.

Conclusions Will be reached by Interstate and their consultants. We will be advised via mail next week (8/28/78)

Recommendations

Investigated by M.R. Mac Donald
Signed

Inspector
Title

V-2

HUDSON MUNICIPAL AIR POLLUTION COMMISSION
532 SUMMIT AVENUE
JERSEY CITY, NEW JERSEY 07306

ROBERT E. HERRMANN
DIRECTOR

(201) 656-0003

February 6, 1973

Ex. 6 [redacted]

Dear Ex. 6 [redacted]:

Reference is made to your complaint as of this date to Mr. Walter Nicol of the Kearny Board of Health, relative to emissions coming from Interstate Metals.

Both the writer and Mr. Statile had completed a survey of this problem at Interstate when Mr. Nicol arrived at the plant to personally check out the complaint you had made to him. This company has been under continual pressure by both offices to install adequate pollution equipment. To that end, they have at last both installed equipment and received an installation permit from the State. They are now in the process of testing this equipment prior to requesting the State to approve it by issuing a permanent permit.

However, both Mr. Statile and myself were dissatisified with the excessive amount of steam emissions. We suggested that they contact their engineers (Root Engineering, Inc.) and investigate the addition of a demistor for the stack. This would enable them to considerably reduce the emission level of the unit. We will follow up, needless to say, on this point with them in the immediate future.

While it is impossible for this Commission to advise every citizen of specific air pollution problems within their area, in light of your demonstrated interest in both local and state-wide problems relative to pollution, we feel that a short summation of the foregoing action by this Commission is both in order and helpful in the continuing struggle to provide clean air for all our citizens.

Again, we are most appreciative of your concern and interest in our mutual goals.

GEORGE L. SHEALY, INSPECTOR

ALFRED J. STATILE, CHIEF INSPECTOR

GLS:JMF
cc: Walter Nicol ✓

"SERVING BAYONNE, EAST NEWARK, GUTTENBERG, HARRISON, HOBOKEN, JERSEY CITY, KEARNY, NORTH BERGEN, SECAUCUS, UNION CITY, WEEHAWKEN, WEST NEW YORK."

v-3

Kearny
partment of Public Heal
and Environmental Protection

BOARD MEETS
THIRD WEDNESDAY OF EACH MONTH
AT HEALTH CENTER
645 KEARNY AVENUE
KEARNY, N.J. 07032

997-0600

COMMISSIONERS
KEARNY BOARD OF HEALTH

LILLIAN CARDOZA, President
VICTOR RUDOMANSKI, M.D., Vice President
JO-ANN CARRATURA
PETER CICCHINO
CHESTER KOZLIK
GORDON FOWLIE
ROBERT R. KERWIN, SR.

EDWARD GROSVENOR
HEALTH OFFICER

Call John
J.H. → Crow
Frank Berg
Post Hurry

May 6, 1986

Mr. Kevin Krause
Metro Office N.J. DEP
2 Babock Place
West Orange, N.J. 07052

RE: Interstate Metals

Dear Kevin:

During our conversation of Monday May 5, 1986 you said that Interstate Metals showed interest in taking the soil samples your office had requested. Interstate Metals also asked to have their property drained by the Town so that sampling could be accomplished.

It is the position of the Town that Interstate is responsible to drain their own property. This is for a number of reasons.

(1) A storm drain that runs thru Interstate property appears to be damaged and does not work properly. In the opinion of the Town engineer, Interstate would be held liable for damage to this sewer line if the Town desired to persue this case.

(2) Due to complaints of a dust nuisance entering homes in the area, from Interstate's waste piles, the Health Department issued a notice to Interstate (approximately 8 years ago) to abate this nuisance. Interstate chose to do so by trucking out to a landfill the accumulated waste. This removal created a crater which now accumulates water and which Interstate never made an attemtp to grade or properly fill in.

Feel free to call me if you have any questions on this matter.

Very truly yours,

John P. Sarnas

John P. Sarnas,
Chief Sanitary Inspector

JPS:cek

N-1

Kearny Department of Public Health and Environmental Protection

BOARD MEETS
THIRD WEDNESDAY OF EACH MONTH
AT HEALTH CENTER
645 KEARNY AVENUE
KEARNY, N.J. 07032

997-0600

EDWARD GROSVENOR
HEALTH OFFICER

JANUARY 8, 1986

Report on meeting
Interstate Metals
275 Dukes Street

10:00 AM

In Attandance: Kevin Krause NJDEP
John Sarnas, KHD
Morley Cole, Interstate
Barry Brown, Interstate

This meeting was held to discuss the results of soil samples taken on 9/20/85 both inside and outside of the fence at Interstate. The attached results show a metals contamination problem and remedial action will have to be taken as outlined on the attached sheet.

Both Mr. Cole and Mr. Brown showed interest in beginning action of removal of contaminated soils as soon as ground thaws. They felt testing was not necessary and one soil and one well water test will be taken in the next month.

By limiting testing Interstate will be required to remove all soil from their property until DEP is satisfied. Mr. Krause agreed to supply Interstate with information on a certified lab and a landfill where contaminated soil can be removed.

Mr. Brown stated but could not provide documentation that some of the problem was from the operation of Keegan Landfill who removed soil from Interstate property in the early 60's and was ordered to refill the land. Mr. Brown contends that it was refilled with contaminated soil. Mr. Kraus stated tht Interstate is responsible unless Mr. Brown can provide documentation to the contrary.

I submitted that if contaminated soil is removed Interstate, will fill in with clean fill and grade their property to prevent the accumulation of stagnant water or a dangerous condition.

Kraus will follow up with order of abatement from DEP and will keep the Health Department informed

W-2

Kearny
Department of Public Health and Environmental Protection

BOARD MEETS
THIRD WEDNESDAY OF EACH MONTH
AT HEALTH CENTER
645 KEARNY AVENUE
KEARNY, N.J. 07032

997-0600

EDWARD GROSVENOR
HEALTH OFFICER

UPDATE INTERSTATE METALS

December 23, 1985

Kevin Krause, of NJ DEP called on Friday December 20, 1985 concerning the latest on the Interstate Metals contamination. His concern was with the company being tipped off and disappearing - thus leaving the state with clean up responsibility. (the DEP has had this problem in the past).

Preliminary testing results have indicated mercury and chromate contamination and they assume more heavy metals will be found. Presently DEP in planning a clean up according to RECRA procedures with Interstate assuming all costs. (estimates of $750,000)

Clean up will include fencing,covering with tarpaulin and eventual cover with impermeable material or removal.

Krause said he will be meeting with the Deputy Attorney General on Friday December 27, 1985 concerning action by the State against Interstate.

We will be informed as soon as something is formulated but we are not to indicate to Interstate any information or possible action at this time.

Submitted by,

John P. Sarnas,
Chief Sanitary Inspector

W-3

Kearny
Department of Public Health
and Environmental Protection

BOARD MEETS
THIRD WEDNESDAY OF EACH MONTH
AT HEALTH CENTER
645 KEARNY AVENUE
KEARNY, N.J. 07032

997-0600

EDWARD GROSVENOR
HEALTH OFFICER

September 9, 1985

Mr. Morley Cole
Interstate Metals
275 Dukes Street
Kearny, N.J. 07032

RE: Contaminated properties

Dear Mr. Cole:

Sampling conducted on soil within your property boundaries indicate high levels of mercury and chromium contamination which "may pose a significant risk to the public health".

While further testing is required to assess the total scope of environmental damage and the remedial action that will be necessary, immediate action is required on your part to have all areas of your property fenced off from either dirt bikers or the general public.

You are therefore notified that your property is declared a Public Health Nuisance under the definition as provided by the NJ Public Health Nuisance and are ordered to provide this department with a plan concerning the fencing of your properties in order to prevent entrance by the general public onto your property.

Failure to provide a satisfactory plan for the implementation of fencing in your property by September 17, 1985 will be cause for daily summons to be issued against you.

Very truly yours,

John P. Sarnas
Chief Sanitary Inspector

JPS:cek
cc: Hudson Regional Health Commission
J. Rogalski, NJ DEP Div. of Enforcement
A. Cavalier, NJ DEP Northern Regional Office

W-4

Kearny
Department of Public Health
and Environmental Protection
BOARD MEETS
THIRD WEDNESDAY OF EACH MONTH
AT HEALTH CENTER
645 KEARNY AVENUE
KEARNY, N. J. 07032
997-0600

EDWARD GROSVENOR
HEALTH OFFICER

May 19, 1982

Mr. Morley Cole
Interstate Metals
275 Duke Street
Kearny, New Jersey 07032

RE: Stagnant Pond on your Property

Dear Mr. Cole:

In regard to the above matter, you will recall that about five years ago you were notified to abate a dust nuisance eminating from the slag piles (a waste product of your operation). Your abatement consisted of removal of slag to sanitary landfill. The result has been a stagnant pond of water which when full, is able to partially run off into the meadows. Presently, however, no run off occurs as the pond (which ranges between 6" to 10" deep) has a depth which is below the depth of the run off ditch.

As this pond is causing a nuisance by being a mosquito breeding area, you are hereby notified to illiminate it.

Although the manner of abatement is at your descretion, the optimum way this could be done is by filling, leveling and grading the area properly so that rain water will not be allowed to accumulate but rather run off in the direction of the ditch or towards the meadows.

Feel free to contact me concerning this matter.

Very truly yours,

John P. Sarnas,
Senior Sanitary Inspector

JPS:cek
cc: Councilman, Richard Naprawa

THE PREVENTION OF DISEASE AND THE PROMOTION OF HEALTH ARE COMMUNITY RESPONSIBILITIES

Kearny
Department of Public Health and Environmental Protection

BOARD MEETS
THIRD WEDNESDAY OF EACH MONTH
AT HEALTH CENTER
645 KEARNY AVENUE
KEARNY, N. J. 07032
997-0600

19

998-7660

September 12, 1978

Mr. Morley Cole
Interstate Metals Separating Company
275 Duke Street
Kearny, N. J. 07032

Dear Mr. Cole:

Findings of a recent inspection of your operation conducted by Mr. MacDonald of the North Hudson Regional Health Commission, leads this agency to believe that a possible degree of lead absorption in your metal division's pouring process could be causing an elevated blood lead level in your employees as well as you.

A high number of cases of this sort in industry are found to be caused by the absorption of lead dust and fumes by inhalation, causing workers to form this high blood lead level over a number of years. Only by monitoring these persons by examination can the degree of intake be measured and then controlled.

This department, in the best interests of public health, STRONGLY suggests steps be taken at your level to have every employee receive a blood/urine lead analysis as soon as possible.

If you require any assistance or have any questions in this matter, please feel free to contact Mr. Edward Tintle of this department.

Very truly yours,

Walter J. Nicol

WALTER J. NICOL
Health Officer

WJN:hm

201 998-7660

INTERSTATE METALS SEPARATING CORP.

SMELTERS - RECLAIMERS - METALS - ALLOYS

275 DUKES STREET

KEARNY, N. J. 07032

July 14, 1976

Mr. John P. Sarnas
Sanitary Inspector
Dept. of Public Health
645 Kearny Avenue
Kearny, N.J.

Re: Your letter of June 29th

Gentlemen:

With reference to the above letter from your office, we respectfully beg to advise as follows:

About a week prior to receipt of your letter and entirely on our own initiative, we made arrangements with a private concern, to utilize a tractor and dump trucks to remove the "piles" from the area in question. The material being removed is being used elsewhere as land fill. The work of removal was begun during the week of June 21st and will continue through the summer.

The elimination of the"piles" once accomplished, will enable us to grade the land so that everything in the area will be in conformance with the regulations and laws of the town.

We further plan to keep the land area in a moist, murky condition which will have two desired effects. First, this will discourage motorcycle riding in the area. Secondly, it will eliminate the possibility of dust in the area.

We anticipate this work being completed by the end of August.

A review of past records will show that we have always tried to initiate steps on our own rather than wait for the appropriate authorities to tell us what should be done. As in the past, we will seek to cooperate to the fullest extent with your office.

Yours very truly,
INTERSTATE METALS SEPARATING CORP.,

Morley G. Cole

MGC:mel
copies: Alfred J. Statile, Hudson Municipal Air Pollution Commission

W-7

Kearny
Department of Public Health
BOARD MEETS
THIRD WEDNESDAY OF EACH MONTH
AT HEALTH CENTER
645 KEARNY AVENUE
KEARNY, N. J. 07032
997-0600

19

June 29, 1976

Interstate Metals Separating Corp.
275 Dukes Street
Kearny, New Jersey 07032

Attention: Mr. Morley G. Cole

Re: Air Pollution from Trade Wastes

Dear Mr. Cole:

This department has been informed by Councilman Silvestri that dust emanating from motorcycle riding on your slag piles is interfering with the comfort of area residents and workers.

As you may know, this is a violation of the New Jersey Air Pollution Control Code, Chapter II, Section 1.3, which states, "No person shall dispose of refuse in such a manner as to cause air pollution".

Neither the Kearny Police nor the Kearny Health Department can patrol your property continuously to see that trespassers are kept off an unmarked area that is serving as an attraction to motorcyclists. Therefore, you are hereby requested to submit to this department, in writing, the following:

1) Plans that would discourage use of your entire property by would-be trespassers that is satisfactory to this department in in accordance with Chapter 76 of the Code of the Town of Kearny entitled "The Fencing of Certain Lands".

2) A time table of how this plan will be implemented.

Failure to respond to this letter by Friday, July 16, 1976, will result in the following by this department.

1) The issuing of summons to you for any air pollution occurring on your property.

2) Termination of your corporation's dumping of waste product on your property.

Very truly yours,

John P. Sarnas, Sanitary Inspector

JPS:el

CC: Councilman James Silvestri

Kearny
Department of Public Health

BOARD MEETS
THIRD WEDNESDAY OF EACH MONTH
AT HEALTH CENTER
645 KEARNY AVENUE
KEARNY, N. J. 07032
997-0600

19

May 5, 1976
at 11:00 A.M.

REPORT ON HEARING

Re: Interstate Metals

On the above date and time a hearing was conducted at the Kearny Health Center to discuss a dust problem emanating from Interstate Metals at the foot of Dukes Street in Kearny.

In attendance were the following:

John Sarnas - Kearny Health Department
Robert Scagiclo - Kearny Health Department
Milton MacDonald - Hudson Regional Health Commission
Max Frankel - Ecology International)
Nathan Frankel - Ecology International) Representing Interstate Metals

Topic under discussion was a dust complaint from Mr. King of Hoyt Street.

Dust samples were taken from Mr. King's home and given to Mr. Frankel for analysis. Samples were also taken from the by-products given off by Interstate for comparison purposes.

The Kearny Health Department made it quite clear that Interstate Metals would be responsible for controlling any dust problem that may come from their slag piles or from any other source that they were responsible for.

Method of prevention was left open to Mr. Frankel to decide although suggestions such as wetting were discussed.

While Mr. Frankel did not accept responsibility on the behalf of Interstate for the dust problem, the Kearny Health Department informed Mr. Frankel that, should any problem in the future be caused by dust from Interstate Metals, they would be liable to legal action by the department.

THE PREVENTION OF DISEASE AND THE PROMOTION OF HEALTH ARE COMMUNITY RESPONSIBILITIES

November 28, 56

Hon. Mayor, Joseph M. Healey
and
Members of the Town Council
Town Hall
Kearny, New Jersey

Dear Sirs:

In reply to your letter of November 7th, 1956 regarding the filling of Block 285 - Lot 114A by the Interstate Concentrating Co., Inc., I am writing the following report.

This writer inspected the property described above, the filling has started. The fill is basically used foundry sand with some metallic particles, there is also some fire brick mixed in the fill.

The fill is excellent material having good properties of compaction, drainage and workability.

In my opinion there is nothing contained in the fill that would present a health hazard to the citizens of Kearny.

Very truly yours,

Walter J. Nicol, Health Officer
Koarny Board of Health

wjn:jej

[redacted] w-10

Copy

INTERSTATE CONCENTRATING CO., INC.
~~44 COURT STREET~~
BROOKLYN 1, N. Y.

Nov. 7, 1956.

Mayor J. M. Healey,
Town Hall,
Kearny, N. J.

Dear Mayor Healey:

We have recently purchased a plot of land, Block 285 - 114A on Bergen Avenue. It is our intention over a period of the next several years to move the Kearny Smelting & Refining Corporation, in which we have an interest, over to this area.

Block 285 - Lot 114A is presently nothing more than meadow land. The by products from our present operation would constitute excellent fill for this land. We are, therefore respectfully requesting your permission to use this land fill to fill in the land.

Yours very truly,

INTERSTATE CONCENTRATING CO.

/s/ Morley G. Cole

11/27/56. A.J.M.

Excellent fill:

Predominantly foundry sand, fire brick devoid of combustible material.

W-11

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

Permit No. 26-2384
Application No. ____
County Hudson

WELL RECORD

1. OWNER Wilpet Tool MFG Co. ADDRESS 244 Dukes St
Owner's Well No. Two SURFACE ELEVATION 10 Feet (Above mean sea level)
2. LOCATION Kearny Hudson Co N.J.
3. DATE COMPLETED April 26 1961 DRILLER Rinbrand Well Drilling Co Inc
4. DIAMETER: top Ten inches Bottom ten inches TOTAL DEPTH 700 Feet
5. CASING: Type steel Diameter 10 inches Length 290 Feet
6. SCREEN: Type ____ Size of Opening ____ Diameter ____ inches Length ____ Feet
Range in Depth { Top ____ Feet / Bottom ____ Feet } Geologic Formation ____
Tail piece: Diameter ____ inches Length ____ Feet
7. WELL FLOWS NATURALLY ____ Gallons per Minute at ____ Feet above surface
Water rises to ____ Feet above surface
8. RECORD OF TEST: Date April 26 1961 Yield 520 Gallons per minute
Static water level before pumping 40 Feet below surface
Pumping level 175 feet below surface after 24 hours pumping
Drawdown 135 Feet Specific Capacity ____ Gals. per min. per ft. of drawdown
How Pumped Turbine How measured Orific
Observed effect on nearby wells none
9. PERMANENT PUMPING EQUIPMENT:
Type Turbine Mfrs. Name Deming
Capacity 500 G.P.M. How Driven Electric H.P. 75 R.P.M. 1750
Depth of Pump in well 200 Feet Depth of Footpiece in well 10 Feet
Depth of Air Line in well 200 Feet Type of Meter on Pump Line Size ____ inches
10. USED FOR Cooling - AMOUNT { Average ____ Gallons Daily / Maximum ____ Gallons Daily }
11. QUALITY OF WATER ____ Sample: Yes x No. ____
Taste no Odor no Color clear Temp. 56 °F
12. LOG Clay, red hard sand Hard panRed rock. Are samples available? no
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Rinbrand Well Drilling Co Inc
14. DATA OBTAINED BY Adam F Rinbrand Date July 24 1961

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

... not now in use. [illegible] up last fall & plans to install new gravity tank not yet completed.

Have pumped well at 300 GPM capacity & don't believe their needs will ever reach that amount.

(dd) Supt. at plant

26-2384

36.12.973

Form DWR-138
11/80

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-5818

APPLICATION NO. ______

COUNTY ______

FOR OBSERVATION PURPOSES ONLY

WELL RECORD

1. OWNER C+A Exxon ADDRESS 100 Schuyler Ave + Dukes St.

Owner's Well No. D1 SURFACE ELEVATION ______ Feet (Above mean sea level)

2. LOCATION 100 Schuyler Ave + Dukes St.

3. DATE COMPLETED 9/7/82 DRILLER Lou Ontek

4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 25'6" Feet

5. CASING: Type PVC Diameter 4 Inches Length — Feet

6. SCREEN: Type PVC Size of Opening .20 Diameter 4 Inches Length — Feet

Range in Depth { Top — Feet / Bottom — Feet } Geologic Formation silty sand

Tail Piece: Diameter ______ Inches Length — Feet

7. WELL FLOWS NATURALLY — Gallons per minute at ______ Feet above surface

Water rises to — Feet above surface

8. RECORD OF TEST Date — Yield — Gallons per minute

Static water level before pumping 15'4" Feet below surface

Pumping level — feet below surface after — hours pumping

Drawdown — Feet Specific Capacity ______ Gals. per min. per ft. of drawdown

How pumped — How measured —

Observed effect on nearby wells —

9. PERMANENT PUMPING EQUIPMENT:

Type — Mfrs. Name —

Capacity — G.P.M. How Driven — H.P. — R.P.M. —

Depth of Pump in well — Feet Depth of Footpiece in well — Feet

Depth of Air Line in well — Feet Type of Meter on Pump — Size — Inches

10. USED FOR Observation AMOUNT { Average — Gallons Daily / Maximum — Gallons Daily }

11. QUALITY OF WATER ? Sample: Yes ______ No ✓

Taste ? Odor None Color Clear Temp ______ °F.

12. LOG ______ Are samples available? no

(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)

13. SOURCE OF DATA Driller

14. DATA OBTAINED BY Lou Ontek Date 9/20/82

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

[redacted] X-2

PROJECT C + A Brown	Diamond Drilling Co. Inc R. D. 3, BOX 368 JACKSON, N. J. 08527 BORING LOG	SHEET 1 OF 1 Job No. [illegible] BORING NO. B 1 LINE & STA. OFFSET
Site: 100 Schuyler Ave. & Duane St. Station # 1543 Permit # 26-5818	DATE, START: DATE, FINISH: 9/7/82	GROUND ELEVATION GROUND WATER ELEV. 15'4"
CASING O D ___ I D ___ SAMPLER O D ___ I D ___ COUPLING O D ___ I D ___	WEIGHT OF HAMMER CASING ___ LBS. SAMPLER ___ LBS INSIDE LENGTH OF SAMPLER ___ IN.	HAMMER FALL ON CASING ___ SAMPLER ___

DEPTH BELOW SUR-FACE	CASING BLOWS PER FOOT	SAMPLE NO. DEPTHS	BLOWS PER 6" ON SAMPLER	DENSITY OR CONSIST. MOISTURE	PROFILE CHANGE DEPTH	IDENTIFICATION OF SOILS REMARKS
0		S-1 0-5			2'	Black top 2" cinder fill
		S-2 5-10			6'	Red - silty sand trace clay with cobbles
10		S-3 10-15			13'	Orange Tan - medium fine sand trace silt
		S-4 15-20				Red Brown - medium fine sand trace silt
20		S-5 20-25				No odor
				25'6"	29'	
30						Refusal
40						

Soils Engineer ______ Driller Lou Cutek

Drilling Inspector ______ Helper Walt Cutek

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	At Boll Moisture	Relative Density (D_R) of granular soils			Consistency of Clayey soils		
Clayey SILT	slight PI	Thread 1/4"	loose	(L)	0 - 40%	soft	(S)	0.1 - 0.5 tsf
SILT & CLAY	low PI	Thread 1/8"	medium compact	(MC)	40 - 70%	firm	(F)	0.5 - 1.0 tsf
CLAY & SILT	medium PI	Thread 1/16"	compact	(C)	70 - 90%	med. hard	(MH)	1.0 - 2.0 tsf
Silty CLAY	high PI	Thread 1/32"	very compact			hard	(H)	2.0 - 4.0 tsf
CLAY	very high PI	Thread 1/64"				very hard	(VH)	over 4.0 tsf

Proportions used: trace : 1 - 10%, little : 10 - 20%, some : 20 - 35%, and : 35 - 50%

~~[illegible]~~ X-3

Diamond Drilling Co. Inc.

R. D. 3, BOX 368
JACKSON, N. J. 08527
BORING LOG

PROJECT: C + A Brown

SHEET 1 OF 1
Job No. [illegible]
BORING NO. B 2
LINE & STA.
OFFSET

Site: 100 Schuyler Ave
Station # 1543 Permit # 26-5819

DATE, START:
DATE, FINISH: 9/7/82

GROUND ELEVATION
GROUND WATER ELEV. 14'9"

CASING O D ______ I D ______
SAMPLER O D ______ I D ______
COUPLING O D ______ I D ______

WEIGHT OF HAMMER: CASING ______ LBS. SAMPLER ______ LBS
INSIDE LENGTH OF SAMPLER ______ IN.

HAMMER FALL ON: CASING ______ SAMPLER ______

Depth below surface	Casing blows per foot	Sample no. / Depth	Blows per 6" on sampler (0-6, 6-12, 12-18, 18-24)	Density or consistency	Profile change depth / elev.	Identification of soils / remarks
0		S-1 0-5			1'	Black top 2" cinder
						Red - silty sand trace clay fill
					4'6"	
		S-2 5-10				Brown - medium fine sand trace silt
10		S-3 10-15				
					15'	
		S-4 15-20				Red Brown - fine medium sand little silt
20		S-5 20-25		22'		
						No odor
					25'	
30						
40						

Soils Engineer ______ Driller: Lou Ostek

Drilling Inspector ______ Helper: Walt Ostek

VISUAL IDENTIFICATION TERMS USED

Clayey Soils		At Soil Moisture
Clayey SILT	slight PI	Thread 1/4"
SILT & CLAY	low PI	Thread 1/8"
CLAY & SILT	medium PI	Thread 1/16"
Silty CLAY	high PI	Thread 1/32"
CLAY	very high PI	Thread 1/64"

Relative Density (D_R) of granular soils

loose	(L)	0 - 40%
medium compact	(MC)	40 - 70%
compact	(C)	70 - 90%
very compact		

Consistency of Clayey soils

soft	(S)	0.1 - 0.5 tsf
firm	(F)	0.5 - 1.0 tsf
med. hard	(MH)	1.0 - 2.0 tsf
hard	(H)	2.0 - 4.0 tsf
very hard	(VH)	over 4.0 tsf

Proportions used: trace = 1 - 10%, little = 10 - 20%, some = 20 - 35%, and = 35 - 50%

X-4

26-12-33 [] 26,4571

FORM 87

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Permit No. [redacted]
Application No. ______
County ______

WELL RECORD

Kearny

1. OWNER Standard Plastics ADDRESS 260 Skyler Ave
   Owner's Well No. 1 SURFACE ELEVATION 10' Feet (Above mean sea level)
2. LOCATION 150' East of Skyler Ave, Lot 2 Bk 242
3. DATE COMPLETED May 17, 74 DRILLER Roland Hipp
4. DIAMETER: top 6 Inches Bottom 6 Inches TOTAL DEPTH 250 Feet
5. CASING: Type Steel Diameter 6 Inches Length 110 Feet
6. SCREEN: Type — Size of Opening — Diameter — Inches Length — Feet
   Range in Depth { Top ______ Feet / Bottom ______ Feet } Geologic Formation Sand, Clay, Red Shale
   0-50 Sandy Clay
   Tail piece: Diameter X Inches Length X Feet 50-105 Sand & gravel
7. WELL FLOWS NATURALLY X Gallons per Minute at X Feet above surface
   105-250
   Water rises to X Feet above surface
   Red Shale
8. RECORD OF TEST: Date May 17, 74 Yield 150 Gallons per minute good
   Static water level before pumping 30 Feet below surface Flow
   Pumping level 120 feet below surface after 4 hours pumping of
   Drawdown ______ Feet Specific Capacity ______ Gals. per min. per ft. of drawdown Wa
   How Pumped air lift How measured drill rods
   Observed effect on nearby wells none to my knowledge
9. PERMANENT PUMPING EQUIPMENT: not yet installed
   Type ______ Mfrs. Name ______
   Capacity ______ G.P.M. How Driven ______ H.P. ______ R.P.M. ______
   Depth of Pump in well ______ Feet Depth of Footpiece in well ______ Feet
   Depth of Air Line in well ______ Feet Type of Meter on Pump ______ Size ______ Inches
10. USED FOR ______ AMOUNT { Average 5000 Gallons Daily / Maximum ______ Gallons Daily }
11. QUALITY OF WATER good Sample: Yes ______ No. ______
    Taste ______ Odor ______ Color ______ Temp. ______ °F
12. LOG ______ Are samples available? ______
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Well Driller
14. DATA OBTAINED BY Roland Hipp Date May 23, 74

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

[redacted] X-5